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CONTENTS

Editorial 179

The Use of Hypnosis in Internal Medicine
BERNARD B. RAGINSKY 181

An Electroencephalographic Study of the Waking State and Hypnosis with Particular Reference to Subclinical Manifestations of Sleep Activity
J. DIAMANT, M. DUFEK, J. HOSKOVEC, M. KRISTOF, V. PEKAREK, B. ROTH, M. VELEK 199

The Abstract Image in the Post Hypnotic State
GOSAKU NARUSE 213

Comment on a Theory of Hypnosis
JEROME M. SCHNECK 231

The Y-State: An Hypnotic Variant
AINSLIE MEARES 237

Simulation and Hypnotic Age Regression
AUBREY J. YATES 243

The Effects of Hypnotic, Post-Hypnotic and Waking Suggestion on Performance Using Tasks Varied in Complexity
HERMAN C. SALZBERG 251

A Note on a Change in Mental Age Accompanying Hypnosis of a 'Teen-Age Girl
HALLACK McCORD 259

The Value and Limitation of Hypnosis in Psychotherapy: Two Clinical Illustrations
MILTON V. KLINE 263

Index to Volume VIII 271

World Congress of Psychiatry 269

Call for Exchange of Publications and Papers 269

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EDITORIAL

This issue marks the completion of seven years of publication for this Journal as the official organ of the Society for Clinical and Experimental Hypnosis. Since its initial appearance, hypnosis has undergone a striking and not insignificant regeneration as an area for continued study and clinical application. Through the pages of this Journal, we have witnessed continuing advancements in theoretical concepts, refinements and modification in clinical technique and above all the movement toward the integration of hypnosis as an aspect of behavioral science generally.

Along with expanding clinical utilization in such fields as anesthesiology, obstetrics, dentistry and the medical specialities, we have observed provocative exploration into the nature of hypnosis and hypnotic phenomena in relation to a general psychology of mental functioning which takes into account particular relationships to perception, learning theory and the psychophysiology of consciousness.

During the seven years since the Journal first appeared, other publications and organizations interested in hypnosis and particularly its clinical utilization have emerged, some with the view of the evangelist and some with the "slychology" of a Barnum. This is a period when we are again witnessing an "overselling" of hypnosis, an exaggeration of its therapeutic value through retrogression to an oversimplified and somewhat inarticulate psychology of suggestion as ancient as the "medical moralization" of the nineteenth century and about as effective.

Historically, the failure of hypnosis had not been its lack of therapeutic success, for certainly the early mesmerizers were equally effective in symptomatic cure as are many practitioners of "suggestive therapy" today.

This historical failure of hypnosis has been one of perspective and the systematic integration of hypnotic phenomena into a meaningful and non-magical concept of human behavior consistent with a valid structure of psychodynamics.

Freud, Janet, Prince, and Sidis, to mention only a few, made giant strides into the grasping of hypnosis as a potent though primitive source of human response and reaction. Freud's concern with psychoanalysis and the rapid obscurity of the contributions of Prince and Janet, two most eloquent spokesmen for dynamic psychology of interpersonal relationships constitute one of the unfortunate but significant turns in the history of hypnosis.

It is painfully clear that hypnosis as a mechanical modality of therapeutic suggestion based upon the magical equations conjured up by the patient or the therapist in a state of diminishing vigilance which permits

much transcendence of voluntary behavioral phenomena cannot long survive. Philosophically, it remains only one step removed from Christian Science, faith healing, flights into health and miraculous cures.

Yet the meaningfulness of hypnosis, the manner in which it reveals the subtle though tenacious threads of prelogical reasoning, emotional intensification and the imprinting of life history continues to offer the scientific investigator a most valuable avenue toward the further understanding of mental functioning and the contiguous aspects of consciousness; dreaming, sleep, reasoning and memory.

Though considerably less than a Pandora's Box, hypnosis affords us a way to perceive more directly the mechanisms that are inherent in the construction of reality and the expression of emotion in the human organism. It has been toward this purpose that the Journal was created and to which it has made during the past seven years a contribution.

Hypnosis cannot stand in isolation and in the pages of this publication, has rarely done so. This is not a Journal for testimonial, nor the expression of personal magical omnipotence. This is a journal where new ideas, explanations, interpretations, critical observations, all have a place in relation to the development of original structures relating to hypnosis and its effects.

It has been a privilege and a source of gratification to have served as the first Editor of this Journal and to see it grow through many struggles and crises. I am indebted to many who have given me support in this endeavor. To name all would be impossible. I am particularly indebted to the Board of Editors both for the backing of a new, untried publication and for the technical assistance which they have given when called upon.

Particular thanks is given to the first Executive Committee headed by Dr. Jerome M. Schneck for creating the conditions that made such an undertaking both possible and successful. The role of the *Woodrow Press* and Mr. Henry S. Tugender in undertaking the first few years of publication is gratefully appreciated and acknowledged. Dr. Bernard B. Raginsky and the late Dr. Linn F. Cooper have been helpful beyond the brief mention that is made here. Needless to say, without the help of many, and only a few have been cited, this Journal would not have survived to its present point of maturity.

It is a genuine pleasure to introduce and welcome a new Editor at this time, Dr. Frank J. Kirkner of the University of California at Los Angeles. I trust that he will be the beneficiary of the same backing and support that was given to me and that under his capable editorship this Journal shall continue to promote the development of scientific hypnosis in all of its ramifications.

MILTON V. KLINE

THE USE OF HYPNOSIS IN INTERNAL MEDICINE*

BERNARD B. RAGINSKY, M.D.

During the past few years, interest in hypnosis has developed at an explosive rate. Explosions are not easily controlled, and this is especially true in the case of the rapidly spreading interest in hypnosis. If it continues at this pace—and it appears that it will—there is a probability that hypnosis will once more be relegated to the quacks, as it has been so many times before during its periodic rise and fall in favour and out of favour in medicine. The likelihood of this eventuality will be lessened considerably if the internist is trained in elementary psychodynamics and uses his hypnotherapy for well-defined purposes.

This requires a new discipline which must be added to the essential knowledge of the organicist. To be successful, it helps for him to have the feeling-understanding of the patient as a whole. Both the psyche and the soma must be well understood. Their relative contribution to the pathology present must be evaluated and the various components of each synthesized in the healing manipulations of the total man. There must be an intelligently directed, individually adapted use of the psychological theory and practice in the treatment of disease. If this be done, hypnotherapy in medicine will find its useful and permanent place in medicine.

Psychiatry as the study of the morbid personality was the gateway for the introduction of the synthetic point of view into medicine. As a result, we have accepted the fact that bodily changes occurring with adverse life situations and accompanying emotions are not haphazard nor evidence of organ inferiority, but are part of an arrangement or pattern in which as much of the organism's equipment is integrated as is needed for a particular protective effort. It is implied that smooth muscle, gland and skeletal functions, feeling states, attitudes and emotions are linked and have direction, *although this direction may be at variance with the conscious purposes of the individual* (69, 55). Selye (57) has done much to broaden our understanding, not only of the endocrine physiology and of the neurohumoral relationships, but of the protean sources of stress to which the human organism may over-react with consequent disturbance of the physiologic balance, sometimes to the point where disease or even death may supervene.

* Presented at the 35th Anniversary Congress of the Pan American Medical Association, Section on Clinical Hypnosis Mexico City, Mexico, May 2–11, 1960.

Just as psychiatry was the gateway for the introduction of the psychosomatic approach to all medical problems, so psychosomatic medicine itself has become the gateway for the introduction of hypnotic techniques in medicine (33, 13). The author is well aware of the benefits to be derived from the use of hypnosis in many fields outside that of internal medicine (34–48), but he believes that it is in the broad field of internal medicine that hypnosis will eventually demonstrate its greatest use in the differential diagnosis and treatment of disease states (49–51, 15, 65).

While hypnosis has been used as a substitute for pharmacological agents (9), there are a sufficient number of drugs in the pharmacopeia to handle the vast majority of cases of anxiety, restlessness and fear. Our analgesics and anesthetics are not ideal but are quite adequate for most patients requiring their effects. Hypnosis is seldom indicated for these purposes in spite of its widespread use. Hypnosis, because it is such a complex tool, should not be used when simpler methods are found to be adequate. For example, the introduction of auditory analgesia for dental work is meeting with approval by both patients and dentists. This method consists of stereophonic music or masking sounds piped to the patient's ears by means of head 'phones. When drilling or any painful procedure is started by the dentist, the patient increases the intensity of the sound reaching his ears by manipulating a hand control. In Garner's practice, this technique has reduced the quantity of local anesthetics used in one year by 90% and of nitrous oxide by 94% (17). This appears to be a simpler method for reducing pain.

It is true that the neophyte in hypnosis must start using it first for relaxation and analgesia, but it is hoped that, as he understands this modality better, he will realize that hypnosis finds its most rewarding use in the areas of differential diagnosis, psychotherapy, the investigation of human behavior and the learning process (66, 67), of which illness and disease may be examples. It should be reserved for the problems peculiarly suited to it. Mastering the induction technique has very little relation to the knowledge required for its therapeutic use. It may take many years of study to understand the very complex relationships involved in hypnotic states.

The use of hypnosis by the internist does not in any way minimize the need for a thorough and complete medical examination. The degree of success in these cases is dependent upon such careful procedures. The greater the professional maturity of the clinician, the more selective he will be in the use of hypnosis. Putting it the other way about, the more professionally immature the physician, the more he will rely on hypnosis for therapeutic or pseudo-therapeutic results. There is a tendency to over-use hypnosis by those who are just beginning to use this method

and who show an intense interest in it. In well-adjusted and well-trained therapists, a state of balanced judgment is reached when sufficient knowledge and experience have been gained to enable them to reconcile hypnosis with broader dynamic concepts of interpersonal relationships and to assign its techniques to their properly limited place in the therapeutic armamentarium. Hypnosis constitutes a tool in internal medicine which may be used in many ways and with great flexibility, but only as determined by its relevance to the therapeutic problem at hand and as an adjuvant to comprehensive psychotherapy. There is little scientific justification and limited value for a concept of hypnosis which remains isolated from the mainstream of psychological thinking and research.

Generally speaking, some use of hypnosis can be made in any medical condition which has an emotional component involved. This holds true whether the emotional disturbance is a factor in the production of the illness or is merely the result of organic distress. Thus, some cases of neuroses with cardiac manifestations respond to hypnotherapy directed at the underlying neurosis, while in other patients the anxiety and the emotional distress resulting from organic heart disease may be ameliorated by the same use of hypnosis. In this instance, however, it is directed primarily towards reducing fear and emotional turmoil which results from impaired cardiac function and consequent fear of death. In both types of cases there may be an improvement in the general sense of well-being as well as in the circulatory functioning. Best results may be anticipated in those cases where symptoms are primarily emotionally determined and less where organic components predominate (52, 53, 64). It is fair to say that wherever psychotherapy has been demonstrated to be important in the treatment, hypnotherapy has a potential contribution.

The pressure of doing a comprehensive medical evaluation in as short a time as possible with sufficient emphasis on the medical and psychiatric aspects has led Winn (68) to formulate a practical way for the clinician to measure the degree of the neurosis, its influence on the illness, and the possible need for referral for proper psychiatric care or the necessity for therapy by the clinician himself. Thus, if the internist plans to use hypnosis for differential diagnosis or therapy he should find out:

1. *What the disease means to the patient.* All patients have some anxiety about their discomforts. One must determine if the anxiety is related normally to the presenting symptom or if it is out of all proportion to the discomfort. The patient's phantasies about the meaning of the symptom are often determined by his personality structure and experiences. For example, if the patient's friends or relatives have suffered from gastric haemorrhage or coronary thrombosis, any sign of hyper-

acidity or extrasystoles may throw him into a panic. He condenses his thinking and sees only the tragic results, as observed in some of his friends. If the meaning of the complaint cannot be made out in an ordinary interview, it often helps to clarify it at the hypnotic level. Under these conditions, many forgotten memories and associations may be brought to light in connection with the complaint and, as a result, relieve the associated anxiety.

2. *How the patient uses his symptoms, even a specific organic abnormality, in the service of his neurosis.* Would the patient's life pattern return to normal if the symptoms of the disease were removed, or do the symptoms help him avoid facing situations too difficult for him. In an emotionally healthy individual the illness does not markedly change his way of life or thinking. In a neurotic, whose symptoms serve a defensive need, the removal of symptoms would increase anxiety or produce other symptoms to replace the one which was "cured." Under hypnosis one may use any one of many techniques to determine the value of the symptom to the patient.

3. *How the patient responds to the treatment situation.* Does he communicate well? Is he able to listen to the clinician? Does he co-operate with him? If any or all of these questions are answered in the negative, we may be certain that the illness has a high emotional content and that the physician may expedite diagnosis and therapy through the use of hypnosis. When the patient enters into a hypnotic relationship with the physician he gives up a degree of control over what determines reality for him because now reality is being filtered through the ego of the therapist. He may now permit reality to assume any range of dimension that the doctor can organize. As such, the patient is attached to him in a retrogressive relationship. Thus the nature of reality to be experienced by the patient is determined to a large extent by what the therapist does and, at times, by what he does not do. While such changes in the reality situation may be produced by certain drugs, the similarity to hypnotic effects are only superficial and are far removed from the benefits obtained through hypnosis (24).

With these three rules in mind, one can see how hypnosis may be used in doubtful cases to separate functional from true organic states or to determine the degree and extent of the functional overlay in an organic disease. It may be used to suppress symptoms temporarily in order to observe where and how the energy is discharged. The patient may be made to visualize all sorts of situations or relationships in order for the physician to see how he reacts emotionally and physiologically to these experimentally induced situations.

Hypnosis may be used to improve motivation. It is not uncommon

for patients to reach a plateau in their convalescence far removed from the level of improvement anticipated. In such cases one or two interviews under hypnosis may change the course of events and increase the rate of improvement. This method can be used when the patient appears to "dry up", does not communicate, or appears to lose interest in himself and others. Of course, hypnosis is not the only method open to the physician in such situations. It is well known that improvement obtained by these means can also be attained at times by changing doctors or even by changing medicines from one innocuous drug to another innocuous drug. However, it would seem that through hypnosis one can get closer to the cause of the arrested improvement than by other means.

In the rehabilitation of patients who have used organic illness for secondary gain, hypnosis may be used with caution. This type of secondary gain is seen occasionally by the clinician in patients who make unexplained poor or slow recovery after illness or operation. The orthopedist is familiar with the patient who hates to give up his cast, his crutches or his insurance benefits. Muscular paralysis and speech difficulties following cerebral accidents have been helped by using hypnosis to reorganize the body image and to motivate the patient to get well and take his place in society (63). Kroger (27) has used it to restrain and to potentiate muscular activity in these patients. He has been able to shorten the recovery period from 30 to 50 percent.

Rehabilitation has a wider connotation than is usually recognized. It includes not only the restoration and extension of the physical and psychological capacities of the patient who has suffered loss of ability through trauma of various sorts (70) but also the habilitation problem itself. This means helping patients who, because of hereditary, congenital or early traumatic events, never had the opportunity to acquire certain skills and functions, need special assistance in the development of their potential resources. As Wright (71) states in his well documented paper, "Hypnosis, as a psychological investigatory and clinical tool, is of importance to rehabilitation because of its potentials for initiating and facilitating various kinds of psychological change." He believes that psychotherapy under hypnosis can often be used with much greater therapeutic effectiveness because of (a) the heightened intensity of the interpersonal relationship between patient and physician; (b) the greater readiness on the part of the patient to utilize the therapeutic offerings; and (c) the characteristics of the hypnotic experience, which may enhance the patient's feelings of control and accomplishment (e.g., post-hypnotic amnesia).

Since the scope of this communication does not allow for illustrative examples of the cases treated, it must suffice to mention by name or

systems the conditions which the author has found to be helped through hypnosis, either as the method of choice or the method which produces results more quickly or because no other method seemed to work in that particular case.

In a broad sense, the anxiety involved in psychosomatic diseases is relieved by channeling the original impulses through the autonomic nervous system into visceral organ symptoms and complaints. These reactions represent the visceral expression of anxiety which is thereby prevented from becoming conscious. The symptoms are due to a chronic and exaggerated state of the normal physiology of the emotion with the feeling or subjective part repressed (58). Hypnotherapy can be effective in selected cases of psychogenic gastrointestinal reactions typified by peptic ulcer-like reactions, chronic gastritis, constipation, pylorospasm, "irritable colon" and anorexia nervosa (11, 12).

Using hypnotic techniques, Ikemi and his collaborators (23) were able to demonstrate the influence of emotions upon physiologic functions of the digestive system. In experimentally designed situations they demonstrated the role of emotional hyperventilation in the production of psychoneurotic symptoms in the digestive tract and showed how important a role the emotions play in stimulating infections in the digestive system.

Because the emotions play such a large part in the production of peptic ulcers, it is not surprising that following subtotal gastrectomy for these conditions, some of the patients develop the "dumping syndrome". This syndrome consists of symptoms of anorexia, nausea, vomiting, vertigo, sweating, cardiac palpitation, fatigue and loss of weight. Some of these symptoms may disappear in a few months after operation, but they may become chronic and require intensive treatment. Since these symptoms are linked with anxiety and neuroticism, Dorcus and Goodwin (7) were able to clear up this condition in their series of patients through hypnotherapy. The most severe case of the "dumping syndrome" which has come to the author's attention did not respond to the usual medical therapies for a good reason. It was found under hypnosis to be related to the patient's sexual impotence, a condition he was able to hide from his doctors with the avowed co-operation of his wife. When the marital situation was exposed in the hypnotic interview, both the husband and wife felt relieved and the condition was discussed and treated openly. The "dumping syndrome" was relieved shortly afterwards. While there is need for a healthy co-operation in the pooling of somatic and psychologic knowledge in the evaluation and treatment of these cases, hypnotic therapy, intelligently applied, has been found to be effective.

In a series of 18 cases of intractable hiccoughs where medical therapy was unsuccessful, Dorcus and Kirkner (8) were able through hypnosis

to stop the hiccoughs in 14 of the patients by producing muscular relaxation and by relieving them of anxiety concerning the spasm and the physical disorder associated with it.

There are several metabolic disturbances in which emotional factors play a part in varying degrees. The most important is obesity, though "emotional glycosuria" and hypoglycemic fatigue are not uncommon. Inadequate as it may be, obesity is usually the result of an individual's attempt to adapt to the emotional stresses to which he is exposed. With an understanding of the conflicts involved, the intelligent use of hypnotherapy has assisted many obese patients to reduce without resorting to the protection of "health farms," fad diets, or the dangerous use of drugs in order to stop appetite and elevate the mood. For some patients the close personal inter-relationship involved in hypnosis satisfies their emotional need for this relationship, and as a consequence they find it relatively easy to follow a restricted diet. In others, the suggestion of anorexia is sufficient to accomplish the same purpose on a superficial level. In still others, the authoritarian command to restrict both the intake and the type of food meets with success.

The physician should be on the lookout for those patients whose obesity has a more serious defensive purpose. An example of this is the adolescent girl or a woman in her twenties or thirties who weighs about two hundred pounds and wants to reduce. Often one finds that this marked obesity is her defense against having to have a boy friend, husband or other social relationships. In truth, they have deep anxieties about sex and are afraid of facing aggression and social relationships. In these patients it is wise to treat the underlying neurosis while treating the obesity, otherwise they eventually put on more weight than when treatment was started. In other obese patients whose main problem is repressed rage and aggression, the author has found that abreaction under hypnosis, to the point of tearing thick magazines and throwing objects about, makes for very easy dieting until the next similar session. As these patients are allowed to express their aggressions without retaliation on the doctor's part, they maintain themselves on a dietary regime without need for much help from the physician.

Patients on a low fat, low salt, or low carbohydrate regime who have difficulty following the diet may be helped rather simply under hypnosis. While hypnosis may be used to differentiate borderline diabetics from non-diabetics, it can also be used to help the true diabetic from having too much difficulty in following the prescribed regime. It can be most helpful in the adolescent diabetic whose emotional moods may result in diabetic coma as a consequence of uncontrolled blood sugar levels. Where ingestion of sufficient food may be life-saving, as in extensive burns,

Crasilneck and his co-workers have produced brilliant results through hypnosis (6, 16).

The large group of sufferers from headaches and pains with no demonstrable organic cause respond particularly well to hypnotherapy (14, 22). Regardless of the precise mechanism of the production of the headache, there is abundant clinical experience to prove that all types of headaches are readily precipitated and made worse by emotional stress and inner conflict. As in all the other conditions mentioned in this communication, neither the psychologic nor the physical aspect of the headache can be neglected with impunity. Anyone who has had experience with cerebral neoplasms will understand the significance of this statement. Harding has made some interesting observations in his treatment of migraine headaches through hypnosis (19, 21). Lester Blumenthal and his associates of Washington, D.C., have contributed a great deal to the study and treatment of these conditions.

Arthritic patients tend to express and discharge unconscious emotional tendencies through voluntary muscles, just as in hysterical conversion. It has been demonstrated that these muscle spasms and increased muscle tonus may, under certain conditions, precipitate an arthritic attack. In the same way, but not by the same mechanism, attacks of gout may be precipitated by emotional upsets. The author has had several patients under observation for years in whom attacks of arthritis or gout could be predicted accurately. These attacks occurred when the proper emotional stimulus presented itself. The emotional stimulus appeared to be almost specific for the individual, so that he would become embroiled in a conflict which resulted in the symptom formation. What is of interest and importance here is that once the attack of rheumatism or gout developed in these patients, the attack could be shortened measurably through hypnotherapy.

The occurrence of neurotic manifestations in and around the spinal column has been receiving more attention in recent years. Investigators have described the "neurotic spine", "hysterical spine", "railroad spine" and the "tired back" of the over-worked and neurotic housewife. These have been found to be susceptible to hypnotherapy in varying degrees, depending on the condition, the susceptibility of the patient to hypnosis, and the skill of the therapist. The author agrees with Rosen (56) that unless the clinician is trained in psychodynamics it is unwise to use uncovering techniques in these patients and even at times it is imprudent to remove the symptoms which may be the patient's last stand against emotional decompensation.

A productive area for the use of hypnosis is for the evaluation of the degree of emotion involved in some types of deafness (26). Psychologic

deafness occurs more commonly than is recognized (29). Atypical audiometer readings should make one suspicious of emotional deafness. Hypnotic techniques can be used to re-educate and to improve hearing acuity (28).

In the treatment of tinnitus, Irving Schwartz uses hypnosis to regress the patient and suggests deafness for the wave-length at which the tinnitus occurs. These suggestions are repeated on various occasions until new patterns are set up (61). As Guild observes, "Whatever the origin of tinnitus, psychophysiological or pathophysiological, the role it has come to play in the patient's life and social adaptation must be considered of central importance in planning hypnotherapy" (18). His method of treating tinnitus can be considered a classic method of the way in which hypnosis should be used to treat any condition for which hypnosis is indicated. Since various personality conflicts and anxieties can come to be secondarily expressed by a tinnitus once established, whatever its origin, these factors must be assessed by a full psychiatric history. If therapy is to be constructive and effective and reduce to a minimum the possibility of substitutive symptom formation, hypnosis must be used within the framework of such a psychologic evaluation and form part of a new balance in the total personality readjustment.

Hypnosis has been used as a tool for the differential diagnosis and treatment of psychomotor epilepsy. A patient suffering from organic epilepsy may be made to have a convulsion while under hypnosis, but once started the convulsion cannot be stopped by suggestion but must complete its cycle. Psychogenic epilepsy may be induced under hypnosis but is differentiated from the organic type by the observation that the convulsion can be stopped at will by suggestion under hypnosis. Much can be done to reduce the frequency of this type of convulsion and at times it is possible to stop it altogether. The results obtained at times appear to be inexplicable with our present knowledge. For example, the author treated a thirteen year old boy who had been having from one to four epileptiform seizures daily for several months with a history of occasional seizures for years. Anticonvulsants helped but did not control them altogether. After three forty-five minute sessions using hypnotic techniques, he remained completely free from these seizures up to the present time, which is a matter of eighteen years. This result was completely unexpected, as the only goal set for the interviews was to relax the patient and set the stage for him to express himself without fear of reprisal. Other clinicians have observed similar responses and have become interested in investigating this problem (30).

Doubt in the patient's mind as to the integrity of his heart is a very frequent cause of chronic incapacity and one which is usually difficult

to alleviate in the neurotic patient (10). Kline (25) reports the successful treatment of one such case by means of hypnotherapy. His case report illustrates how situational experiences can, on the basis of their relationship to a primary psychologic function (perceptual), give rise to physical symptomatology which becomes easily reinforced. In his opinion, psychosomatic reactions involving psychopathology can make best use of hypnosis as an integral part of the psychotherapeutic approach to personality reorganization and adjustment.

The author has had occasion to see a few patients in the course of the years within an hour of the onset of coronary occlusion, paroxysmal tachycardia, heart block or the onset of frequent extrasystoles. Electrocardiograms taken on arrival as compared with electrocardiograms done a half to one hour later, following immediate hypnotherapy to reduce anxiety and shock, are indicative of what can be accomplished by a "hypnotic leucotomy" (60). More recently we were privileged to be present at a patient's home when, during a discussion, he developed a massive cardiac infarct. He was immediately hypnotized and rushed to the hospital. The marked deteriorating changes in the electrocardiograms from the first one taken were not accompanied by the condition of shock usually associated with such massive damage. Since no other measures were taken at the time, it is possible that the "hypnotic leucotomy" helped to prevent further damage and perhaps avoided a fatal outcome of the cardiac accident. In a less acute situation, Schneck (59) reports his findings in a hypnoanalytic study of a patient with extrasystoles.

The early fluctuating phase of essential hypertension is a manifestation of a psychoneurotic condition based on excessive and inhibited hostile impulses, a condition which has become much more frequent in our time. Hardly a day goes by without the clinician seeing one or more patients suffering from this condition. This tension is part of the whole defense mechanism, psychologically and physiologically a general attitude of being on guard. In selected cases where the newer drugs have either failed to ameliorate the condition or have produced side effects which required the withdrawal of the drug, hypnotherapy has been found to have a very salutary effect.

Occasional instances of apparent allergic responses, including some cases of hives and angioneurotic oedema, have a major emotional element in their production. It is noteworthy that the group of patients with negative skin reactions are also the multiple complaint group. They express a variety of illnesses and complaints, indicating a strong content of factors characteristic of psychologic maladjustment. People can become just as sensitive to certain ideas or situations as some others are

sensitive to pollens. It is in this group that hypnotherapy appears to be effective. Some forms of dermatitis are quantitative exaggerations of mild skin reactions. This is an additional symptom anxiety occurring in a sensitive individual whose anxiety is reflected through the skin rather than through the gastrointestinal tract or the cardiovascular system and may respond to hypnotherapy.

Harold Abramson (1) in his discussion of pseudoallergic schizophrenia as a new clinical entity brings attention to the important findings of Hoch (20). Some patients heretofore considered neurotic may show clinical symptomotology very similar to that seen in schizophrenia. A number of such patients have short psychotic episodes but do not deteriorate as schizophrenics may. He classifies them as pseudoneurotic schizophrenics. They are the multiple complaint group and because of their personality structure do not respond well to the usual measures carried out by allergists. Hypnotherapy in these patients produces brilliant results at times, but it should be clear that hypnotherapy in such patients should be reserved for those clinicians well trained in psychiatry.

Using prolonged hypnotic sleep, A. C. de Moraes Passos (31) has helped patients suffering from hypertensive crises. Using the same method, he was able to help asthmatic patients. The use of hypnosis in treating some asthmatics is a fertile field of therapy. The author has been able to relieve a number of asthmatic patients who had become "adrenaline fast" and who were in status asthmaticus. Attacks of bronchial asthma seem to be associated with a very considerable variety of conflicts. Outstanding among these are the suppression of any sort of intense emotion, threats to dependent relationships and the security based upon them. The interrelationships involved in the hypnotic situation is helpful per se, but can be harnessed for greater effect through understanding the mechanism involved in the particular patient.

In chronic and hopeless diseases, such as multiple sclerosis and cancer, the internist's ability to carry these patients through their travail taxes not only his therapeutic resourcefulness but also his general ability to deal with human suffering. Hypnosis has been used in conjunction with general psychotherapy in some of these cases with gratifying results.

Shapiro and Kline (62) have used hypnosis in evaluating the physiologic and psychologic components in the functional impairment of the patient with multiple sclerosis. Psychologic test data were used to formulate a mechanism whereby the patient's hypnotically altered perception and conception of his damaged body image served as a means of reducing anxiety and depression and improving his performance.

Ambrose (2) treated six such patients under hypnosis with a resulting marked subjective improvement. His aim is to put the patient more in control of his organism. He believes that while the nature of the illness prevents the clinician from "feeling scientific in his approach to these cases", nevertheless, much subjective improvement is possible with the use of hypnotherapy.

The author is in accord with the findings of these investigators. In a series of eleven cases of multiple sclerosis treated with hypnosis as part of the total therapy in his private practice, the results were somewhat impressive but hardly consistent. A married woman, twenty-two years of age with one child aged two, had been confined to her bed for seven months with multiple sclerosis when first examined. She was treated at the hypnotic level weekly for the following sixteen years, during which time, though bedridden, she gave birth to two healthy children. She died nineteen years from the time of the first consultation.

A young executive committed suicide a little short of five years from the time the writer made the original diagnosis of multiple sclerosis. It seemed as if hypnotherapy was helpful in allowing this patient to carry on his business duties from his bedside during these years, but the suicide note revealed that while the hypnotic sessions were "helpful" in enabling him to carry on, nevertheless he could see that he was "deteriorating organically" and could carry on no longer. Another young man suffering from this disease requested hypnotherapy. He was convinced from his reading on the subject that he could be cured. He was intelligent and determined to succeed. Unhappily, he could not be hypnotized, at least by this author, and after six attempts during a period of a month he did not return. The impression gained in this instance was that the patient was intent and desperate in helping himself which allowed for very little outside help.

In contrast to the others, a bright young business man aged 27, who suffered from the most acute type of multiple sclerosis the author has seen, appears to be doing very well indeed. When first seen one and a half years after a fulminating onset of partial blindness, deafness, ataxia, with motor and sensory changes of a marked order, he responded so well to hypnotherapy that the diagnosis of multiple sclerosis was suspect. However, the diagnosis was made and confirmed on several occasions at two of the best Neurological Institutes on the continent and appears to be born out, in that five years after his hypnotherapy, while he has no subjective symptoms of any kind, physical examination still reveals nystagmus, migrating sensory changes, weakness in various muscle groups and altered superficial reflexes. During these five years up to the present time he has been working full time and has had no return of the

symptoms experienced during the first year and a half of his illness. The prognosis for a patient with this type of onset, as recorded in various neurological textbooks, is from two to three years. This problem is worth investigating further.

In patients suffering from various types of cancer, the use of hypnosis can contribute to the patient's comfort not only in the terminal stages of the disease but also during any time starting with the time the patient is informed of his malignancy. Morphis (29) assists the patient in accepting the diagnosis through the use of hypnosis. As a radiologist and radium therapist he helps the patient to tolerate better the radium needles inserted in the malignant area through the use of the same modality. Finally he uses it to help control the nausea and vomiting associated with radiation therapy. Butler (3) finds the use of hypnosis helpful in the care of the cancer patient. Conn (5), using this method, finds that this type of patient is relieved from distress for varying periods of time. In his experience, hypnotherapy substantially reduces the need for narcotics and keeps the patient comfortable and free from anxiety.

In addition to reducing pain and anxiety in these patients, we suspect that hypnotherapy may at times prolong the lives of these individuals to a surprising extent. In several patients with generalized metastases confirmed by laparotomy, where the surgeons' prognosis of life expectancy ranged from two to six months at the most, hypnotherapy appeared to be a significant factor in extending their lives from eight months to three years. In the series under discussion, radiation therapy was not used for various reasons in any of the patients. It would seem that just as an optimistic consultant may help a patient with carcinoma to put on weight, so may well-directed hypnotherapy in selected cases harness a patient's resources so that it not only makes him comfortable and free from anxiety, but may extend his life expectancy appreciably (54, 32).

In the distant future, when many of our present-day "wonder drugs" have been discarded and forgotten, the human relationships invoked in hypnosis will still be used as they have been from time immemorial. No chemical will ever take the place of warm human relationships or be a substitute for human kindness, understanding and help. These attributes are the keystone in the practice of internal medicine. When the public and the profession believe that the physician using hypnosis is not a "medical hypnotist" but a physician who uses hypnosis as one of the many tools in his kit, medicine will make more use of this valuable technique.

Summary

Just as psychiatry was the gateway for the introduction of the psychosomatic approach to all medical problems, so psychosomatic medi-

cine itself has become the gateway for the introduction of hypnotic techniques in medicine.

Generally speaking, some use of hypnosis may be made in any medical condition which has an emotional component involved. This holds true whether the emotional disturbance is a factor in the production of the illness or is merely the result of organic distress. Best results may be anticipated in those cases where the symptoms are primarily emotionally determined and less where organic components predominate. Wherever psychotherapy has been demonstrated to be important in the treatment, hypnotherapy has a potential contribution.

Various conditions met with in the practise of Internal Medicine which have responded well to therapy at hypnotic levels are described.

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AN ELECTROENCEPHALOGRAPHIC STUDY OF THE WAKING STATE AND HYPNOSIS WITH PARTICULAR REFERENCE TO SUBCLINICAL MANIFESTATIONS OF SLEEP ACTIVITY

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The basis of hypnosis is thus far an unsolved scientific problem. In the world literature we meet with a large number of publications dealing with this question from various standpoints. The relation between hypnosis and sleep has also been the subject of intensive study. In recent years EEG has played a more and more important role in such studies of hypnosis, along with polygraphic research to register a number parameters of CNS state during hypnosis simultaneously.

EEG Findings in Hypnosis

Loomis, Harvey & Hobart (31) recorded the EEG during hypnosis and reported curves characteristic for the waking state. Marinesco, Sager & Kreindler (39) first showed in hypnosis rapid transitory phases of augmentation of both potential and frequency, then a decrease in potential and frequency, with, however, a dominant alpha rhythm. The above frequency changes did not exceed the norms for the waking state. Sirna (66) attempted to use EEG to study dreams produced during hypnosis, and concluded that hypnosis and sleep are not equivalent states.

Lundholm & Löwenbach (34), Spiegel, Shor & Fishman (68), Dynes (12), Ford & Yeager (15), Heimann & Spoerri (20) reported EEG records of hypnosis equivalent to the waking state.

Some authors conclude that there is a resemblance to the sleep pattern; even that the two are indistinguishable. Barker & Burgwin (2, 3) believe that this can occur only on the basis of suggestion which markedly reduces integration with the surroundings, or the direct suggestion that the subject should sleep. If no such suggestion takes place, the EEG is that of the waking state.

Recently reports of EEG records of hypnosis have increased in num-

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ber, usually of a more specialised variety, such as that of Darrow et al. (8, 9), McCranie, Crasilneck & Teter (40), Schwarz, Bickford & Rasmussen (64), Yeager & Larson (73).

Vávra & Mělka (70) showed that a painful stimulus during hypnotic analgesia depresses the alpha waves, even without any visible effect on the subject. With suggestion of a light stimulus there is also a depression of the alpha rhythm just as with an actual light stimulus. Rusinov et al. (see Chugunov, 6, pp. 64–65) have also found the effect of suggested light stimulus on the EEG of hypnotic subjects. Similar effects were also demonstrated with auditory, tactile and painful stimuli.

Veselý (71) found normalisation of the EEG curve in hypnosis with a dominant alpha rhythm. Krákora (25) showed that no differences from the waking pattern appeared in the EEG while the hypnotist spoke with the subject or while some manipulation was taking place under hypnosis. After a given time interval from the last suggestion, however, the typical sleep pattern set in. If the EEG showed a sleep pattern, then the subject was not observed to follow a given suggestion in that period. Krákora concluded, therefore, that the subject loses contact and goes into a state of deep inhibition which has the character of normal sleep with a marked "guardian point" in the Pavlovian sense. From this state the subject returns to contact with the address of the hypnotist.

According to Kline (24) "when the hypnotized person is listening to the hypnotizer or carrying out his commands, he has a waking EEG but when he is left to himself this is replaced by an EEG indistinguishable from that during deep sleep".

The Pavlovian concept of hypnosis is confirmed by the results of Das (10) and Nevsky (40–44). According to the latter (41, 45) it is possible to differentiate 4 EEG stages, both for gradual deepening of hypnosis and for natural falling to sleep: 1) equilibration of the alpha rhythm, 2) alpha spindles, 3) minimal electrical activity, 4) waves of frequency 4–7 cycles. The stage of high voltage delta waves at a frequency of 1–3 cycles and 300–500 μV, which corresponds to deep physiological sleep, cannot be demonstrated in hypnosis according to this author.

Marenina (35) recorded curves in hypnosis similar to records of the waking state. She maintained that Barker & Burgwin achieved sleep-like records in "hypnosis" probably because they were actually working with a state of sleep. The same author (36) paid particular attention to the somnambulist phase of hypnosis using EEG, and she studied detailed EEG records in various stages of hypnosis (37, 38).

Horvai (21, p. 114) summarized his own and other results with the conclusion that the EEG of hypnosis can assume the character of all

states from waking to moderately deep sleep, the somnambulist form of hypnosis being at most associated with only slight change in EEG, i.e. there is no really deep state of inhibition, as judged by the EEG.

Chertok & Kramarz (5) report a study of ten subjects whose EEG records of the waking and hypnotic states were examined. In six subjects, there was no significant difference between the waking state and hypnosis tracings; in two subjects, tracings of light sleep were obtained, but the waking state pattern reappeared during active communication with the outer world. In two subjects, tracings difficult of interpretation were found; in one of the latter, the slowing down of the tracing might suggest a slight sleep condition. In the other the desynchronization of alpha activity and accentuation of ocular artifacts might suggest a hypervigilant state. In both cases active communication did not modify the record.

Franck & Thren (16) studied the EEG in Kretschmer active hypnotic exercising, Das & Gastaut (11) in yogi meditation, Rohmer & Israel (53) in Schultz autogenic training. Bagchi & Wenger (1) showed that in so-called meditating yogis in a state of concentrated meditation there were well-modulated alpha waves without any sign of rapid components. They concluded that yogi meditation is a deep automatic relaxation with waking cerebral activity of a given type.

EEG was used to study also so-called animal hypnosis (Schwarz & Bickford, 65). Of significance is the observation of Svorad (69) that in animal hypnosis (paroxysmal inhibition) the EEG develops in the same manner as in natural sleep. This is in agreement with other observations, e.g. Gerebtzoff (18) who showed that the electrical activity of the cat and rabbit brain in a hypnotic state is similar to that of sleep; a rise in amplitude and decreased frequency was observed.

The literature review here given is far from exhaustive. For further data on the physiology and special electrophysiology of hypnosis we refer the reader to Gorton (19), Weitzenhoffer (72), Sarbin (63), Reiter (52), and Crasilneck & Hall (7).

Methods and Experimental Subjects

For simultaneous recording of EEG, ECG, EMG and respiratory rate the 8-channel Reega VIII-Mobile (Alvar) instrument was used. EEG was recorded with 5 leads in transverse connexion—two frontal, two parietotemporal and one occipital. Pulse recorders were located on the right upper and left lower extremities. EMG changes were registered with superficial electrodes on the left forearm. Respiratory rate was recorded from a mouthpiece of plastic material with a thermocouple. The stimulus

was the Soneclat (Alvar) instrument giving a varying frequency of light stimuli and frequency and intensity of tone signals. Paper speed was either 15 or 30 mm/sec.

The experiments were carried out on 10 psychiatric patients (alcoholics, neurotics and psychopaths). This circumstance did not embarrass the research, since in the first instance there was made a comparison of the waking and hypnotic states, with evaluation of possible changes produced by hypnosis. The experimental subjects were used for observational runs only after several experiences with hypnosis. To each patient it was stressed that this procedure was therapeutic, during the hypnotic training sessions. The actual experiment with polygraphic recording then took on the meaning to the patient of a control investigation to check up on his health status. Verbal-fixation technique was used for hypnosis. We used suggestions of relaxation, sometimes without suggesting sleep, but occasionally mentioning it.

The actual experiment comprised three parts: 1) waking, 2) hypnosis with rapport, 3) hypnosis "without rapport" (that means without verbal suggestions).

1) In the waking state the EEG, ECG and respiration were recorded for 6 min. with verbal stimulation and 6 min. without. The polygraphic reaction to light, sound and pinprick were determined.

2) The second part of the experiment started with the induction of hypnosis, during which the subject had his left hand flexed. After induction, polygraphic records were made during hypnosis with rapport of 6 min. duration. Then, as in the waking state, the reactions to light, sound and pinprick during suggestion of anaesthesia were tested.

3) The third part of the experiment was as the second part, with the only difference being hypnosis "without rapport".

In order to determine the depth of hypnosis, inability to open the eyes, move the arm, feel a pinprick, were suggested, along with suggested amnesia and posthypnotic suggestion.

According to these criteria, 4 of the investigated subjects were in light hypnosis, 3 in moderately deep and 3 in deep hypnosis.

Evaluation of Records

With relation to previous experience and reports in the literature we did not expect to find records of deep sleep in the EEG during hypnosis. We considered it likely that we would find records of light sleep, corresponding to various stages between waking and sleeping.

In this respect the work of Roth (17, 22, 23, 46, 47, 54–62) must be mentioned concerning sleep activity and its subclinical occurrence. Roth starts from the original EEG classification of stages of sleep given by

Loomis, Harvey & Hobart (31, 32, 33). The first stage of sleep activity according to the latter authors is characterized by disintegration of the alpha rhythm, which becomes irregular with a decreased amplitude, and finally disappears. It must, however, be stated that disintegration of the alpha rhythm may be anteceded by its accentuation (or activation) as well as hypermodulation. The 2nd stage (stage B of the above authors) was subdivided by Roth into 3 phases, labelled 2a, 2b and 2c. 2a is characterized by flat records with marked depression of electrical activity and is probably identical with so-called zero activity of Blake & Gerard (4). There sometimes develops in this phase rapid waves of low amplitude. In 2b there are waves of frequency 5–6 cycles/sec, amplitude 10–40 μV. Phase 2c is characterized by waves of frequency 3–4/sec, amplitude 50–80 μV. The transition from waking to sleep is therefore subdivided into 4 stages: 1, 2a, 2b, 2c. Complete sleeping state occurs between 2c and stage 3, characterized by spindles at a frequency of 14–18/sec.

In the course of falling asleep there is a marked change in reactibility. While in the waking state the reaction of blocking the alpha rhythm almost always occurs, according to Roth this reaction becomes negative in stage 1 and 2a; in 2b and 2c it becomes paradoxical, i.e. during the external stimulus the alpha rhythm, otherwise no longer present, reappears. In 2c vertex waves appear. K-complexes as a stimulus reaction occur in deeper stages of sleep, beginning with stage 3.

Activation procedures usually lead to disappearance of sleep activity and normalization of the record, which simplifies differentiation from pathological activity, which is, on the other hand, accentuated by such procedures. This is valid for deep breathing, and for activation with metrazole and benzedrine. After cessation of deep breathing one can sometimes observe a temporary normalization of record rapidly shifting again into sleep activity which can be deeper than before hyperventilation.

Roth believes that this described study of superficial sleep activity, corresponding to the transfer from waking to sleep and characterized by corresponding changes in reactibility, have a close relationship to so-called hypnotic phasic phenomena, described by Pavlov (48, 49), even if they are not identical.

The EEG manifestations of superficial sleep activity can be associated with greater or lesser clinical signs of sleepiness. Very often, however, they appear without any clinical manifestations whatsoever. Many of these patients may, of course, complain of fatigue and sleepiness. The occurrence of sleep activity, clinical or subclinical, in the EEG of healthy subjects is usually 10 to 15%. In some diseases manifestations of sleep

activity are very frequent, almost constant. This is the case, according to Roth, in narcolepsy and hypersomnia, in organic affections of the mesodiencephalic region, particular of a traumatic, inflammatory or neoplastic nature (Jindrová, Roth, Stein & Zuklínová, 22), in some cases of psychomotor epilepsy, in normocalcemic tetany (Nevšímal & Roth, 46, 47), and finally in neurosis and in pseudoneurotic syndromes. According to Klimková, Macek & Roth (23) one can find signs of superficial sleep activity, or an insufficient state of waking, in 65% of neurotics. Roth believes that in these cases it is the result of an organic lesion or functional insufficiency of the ascending activation reticular system, and considers that some neurotic signs are conditioned by insufficient activation of the cortex by the non-specific activation system.

Signs of subclinical sleep activity have been described by a number of investigators, in particular Liberson (29, 30), as findings in some psychiatric affections, particularly in depression. Fischgold et al. (13, 14), Lairy-Bounes & Dell (26), Lairy-Bounes, Garcia-Badaracco & Dell (27), Lairy & Benbanasti (28), and Soucachet (67) also described subclinical sleep activity in narcolepsy, psychomotor epilepsy, traumatic, neoplastic and inflammatory affections of the mesodiencephalic region, in some endocrine affections, and finally in a number of psychiatric syndromes. These authors speak of a so-called "sub-vigilant" state.

Results

10 subjects in all were investigated; 1 record was taken from each. The results are summarized in two tables.

As can be seen from Tables 1 & 2, a waking record was in two cases

TABLE 1

EEG in waking state and hypnosis

	Normal	Abnormal	Sleep activity
Waking state	4	2	4
Hypnosis with rapport	4	2	4
Hypnosis "without rapport"	3	2	5

TABLE 2

EEG changes during transition from waking state to hypnosis

Unchanged	Increasing	
	Wakefulness	Sleep
7	1	2

slightly abnormal, relating to the basic disease, in 4 cases it was normal, and there were 4 cases of insufficient "vigilance", manifested by superficial activity of stages 1 to 2b.

During hypnosis (with rapport) there were 2 pathological records, 4 normal and 4 of superficial sleep activity.

With hypnosis "without rapport" there were 2 abnormal, 3 normal and 5 records of superficial sleep activity.

On analysis of individual records, comparing the waking period with hypnosis, it was shown that 7 cases had no change, on one occasion there appeared a previously absent sleep activity of a superficial character, in one case somewhat deepened a previous sleep activity, and finally in one case a previous sleep pattern disappeared and the record was normalized. One can say, therefore, that the waking records did not differ from the hypnotic ones, regardless of the degree of rapport. Signs of a decreased state of wakefulness were found in 40% of cases, but were present not only in hypnosis, but without it as well, and also during the waking state. This is obviously related to the fact that these patients were afflicted with neurosis and psychopathy, where the occurrence of subclinical sleep activity has often been described.

We further compared the occurrence of sleep activity in records during hypnosis with the depth of hypnosis. Superficial sleep activity was found more frequently with light hypnosis than with moderately deep or deep hypnosis. Since the experimental group is small, no statistical workup was carried out.

As concerns reactibility to external stimuli, the following was observed: *Waking state*—normal reactibility. Stimulus applied during the alpha rhythm led to its depression. In the case of stimulus application during superficial sleep activity the reaction has the character typical for the corresponding stage of this activity. *Hypnosis*—the effect of stimuli were in the main similar as in the waking state. The blockade (alpha) reaction was positive 7 times, sluggish once, and negative twice. In one of the two last patients the reaction was also negative in the waking state, conditioned by a superficial sleep activity of type 2a. One can say, therefore, that in 8 cases the blockade reaction was unchanged in comparison to the waking state, and only twice was it decreased.

If the hypnotized patient received the suggestion that he was not perceiving the stimulus, and the stimulus was applied, the stimulus was almost always effective. Only in one case did one patient not react on one occasion to pinprick, even though previously he had always reacted. Light stimuli were always effective.

In hypnosis we found no significant changes in frequency of pulse or respiration in comparison with the waking state. In some cases a fall was recorded, in others a rise (Fig. No. 1 and 2).

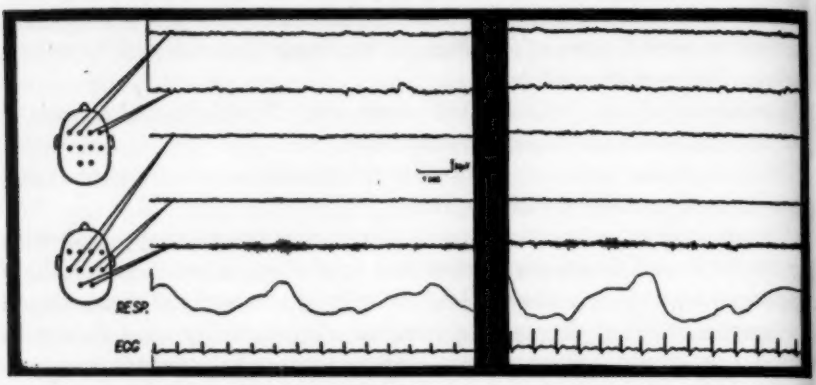

FIG. 1. J. S. First part during wakefulness. Second part during hypnosis. Normal EEG activity in both parts.

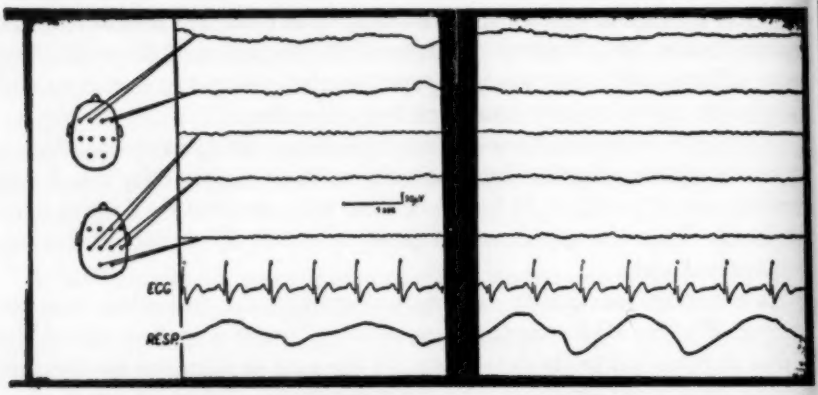

FIG. 2. L. L. First part during wakefulness. Second part during hypnosis. Superficial sleep activity/stage 2 b/in both parts.

Discussion

Analysis of reports from the literature is difficult, since the experimental conditions are seldom adequately described, nor is the depth of hypnosis always imparted. It is probable that under the heading of "hypnosis" are various different types of state. The technique of hypnosis may influence the experiment significantly, and often the actual technique is not presented.

Starting from our previous studies of sleep activity, we evaluate even very fine changes bearing evidence of a decrease in the waking state. Even with this type of evaluation with which we can determine manifestations of decreased wakefulness in 65% of neurotics, we cannot show a difference between the waking state and hypnosis. This is in agreement

with most of the published reports. The EEG gives sensitive evidence of the most superficial degrees of sleepiness, often before this state becomes objectively or subjectively obvious. On the other hand, hypnosis, with its clear clinical signs of inhibition, is associated with normal records.

In the literature we meet with the occasional report of hypnosis associated with an EEG record of superficial sleep activity. It is most probable that these cases had slipped from hypnosis into actual physiological sleep. This is suggested by some reports in the literature that such a pattern appears if a sufficient interval is allowed to elapse from the last suggestion (Krákora, 25). In agreement with this is the observation of Krákora that the record from hypnosis with contact is always the same as from the waking state. It is further important that in the mentioned cases the EEG mostly represents "hypnotic sleep". If one is to investigate the actual basis of the hypnotic state one must use other suggestions than that of sleep. Sleep activity was not observed, as far as we know, in these patients. It would appear that this is due to the fact that the described EEG changes of a sleep character in hypnosis are most frequently conditioned by the transition from hypnosis to physiological sleep or sleepiness. A further source of error may be the up to now little known fact that superficial sleep activity is a relatively frequent finding even in a clinically completely waking state, particularly in neurosis and some psychiatric affections. If such a record from a hypnotic state is not subject to the control of comparison with a record from the same patient awake, error will occur.

If the morphology of the EEG record shows no difference between hypnosis and the waking state, what about reactibility? This would also appear to show no significant change. In a minority of cases there was a slight decrease with hypnosis but not to a significant degree. It is difficult to evaluate the significance of the suggested stimuli, since these were associated with real stimuli, the suggestion produced a state of concentration and disturbance in the patients, and the latter factors may depress the alpha rhythm even in the waking state.

The results of pulse and respiratory rate changes, and measurements of skin conductance published in the literature, also show lack of agreement. Some authors report values equivalent to the waking state, others, values equivalent to a state of sleepiness or sleep.

Under the given conditions it is very difficult to satisfactorily explain the basis of hypnosis. Even if most of the clinical manifestations of the hypnotic state are of an inhibitory character, the subject nevertheless perceives and can remain in rapport with the hypnotist. As opposed to sleep, it is also possible in the hypnotic state to establish conditioned re-

flexes (Platonov, 50, 51). If we assume that the basis of the hypnotic state is a process identical with that of sleep, then we have two possibilities to explain the differences in EEG findings: 1) intensity of inhibition in hypnosis is far less than in sleep, 2) the topographical distribution of the inhibitory process in the CNS is different.

As concerns the first possibility, hypnosis would have to involve an inhibitory process of lesser intensity than the most superficial sleepiness, which is not in agreement with the clinical manifestations of hypnosis, which suggest a more marked degree of inhibition. The latter possibility cannot be completely excluded. It must be stated, however, that subcortical localisation of an inhibitory process would be expected to project into the cortex, and this projection should be manifest in the EEG, and that a cortical focus involved in such a process has not yet been demonstrated. Despite this it is conceivable that some sort of inhibitory process might be distributed in the CNS in some sort of way that is not detectable by present-day methods of EEG.

A further possible explanation would be the assumption that hypnosis does not concern a phenomenon qualitatively identical with sleep, but a quite different phenomenon related to a relaxed waking state.

Definitive evaluation of the basis of hypnosis is, of course, not possible only on the basis of EEG analysis. One must simultaneously evaluate clinical data, the state of higher nervous activity by means of the classical Pavlovian techniques, EEG findings, skin conductance and temperature, frequency of pulse and respiration, EMG, etc. One must also proceed in a unified and organized manner, and always be quite sure that hypnosis has not crossed over into physiological sleep, and that hypnosis induced with some other suggestion than that of sleep is used also for investigation.

Conclusions

EEG records have been investigated in 10 patients in a waking state and under hypnosis. It was shown that no differences existed between these two states in terms of EEG. EEG signs of decreased wakefulness can be demonstrated in some of the patients, but these were also present without hypnosis. This latter effect appears to be subclinical sleep activity (Roth), frequently seen particularly in neurosis. Reactibility to external stimuli under hypnosis was also, in most cases, equivalent to reactions in the waking state. The authors incline to the view that EEG data does not support the concept that the nature of hypnosis and sleep is qualitatively the same.

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THE ABSTRACT IMAGE IN THE POST HYPNOTIC STATE

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I. Introduction

Prince (9), in his experiments, studied some visual images, of not revived material, but largely newly created visual representations of a past experience or fabrications. Furthermore, he discussed the secondary visual image which was built up from the subject's ideas of the self and environment, through a more complex mechanism (8). M. V. Kline, in order to investigate his case of experimental hypnotherapy, presented a hypothetical discussion of the two kinds of image formations; primary images involving associative reactions, and secondary imagery referred to correlative perceptions (5). The investigation of visual image which has not been directly experienced in the past visual perception, will be an important field of psychology in the future, for such an image refers to a specific field which is correlated to two functions, viz. perception and imagination, or memory and thinking in primitive form. To understand sufficiently the process of image modification or image production in general, therefore, the function of the second effect or "meaning" must be studied.

Naruse and Obonai investigated mainly the mechanisms of modification of the visual image in PHHS (the post hypnotic hallucinatory state) (10–16). They found decomposition and fusion of mental images in addition to the original image. Furthermore, they emphasized the effect of "meaning" of stimulus figure as an important factor which gravely modified the reproduced image. Naming such an effect of stimulus figure, i.e. the perceptual experience to such a modification, as the primary effect, we may characterize one of the meanings as the secondary effect.

Following such a terminology, we may describe the image supplement as meaningful, but incompleted figure reported in their paper (13) as follows the primary effect of incompleted shape was reconstructed and fulfilled its incompleteness by the secondary effect, and appeared in a completed form of image. The image composition by "meaning" and "shape" may be also described as a resultant of an antagonistic conflict or as an associative cooperation between the secondary effect and the primary one on the motivational level of image formation.

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In what mechanism or how may the second effect, i.e. the concept, idea, representation or meaning, etc., represent itself in the image? In order to investigate separately the secondary effect on the image formation, let us confine our consideration in the present paper to the above question. In the author's image conditioning procedure, it was necessary to use the concrete visual figure as the primary effect. By contrast, the concept, idea or meaning was never given directly to the subject through any concrete figure. It may be said that the latter is the secondary higher order, or abstract determiner of image. If we can condition such a secondary determiner to some suitable medium, an image prescribed by the secondary determiner may appear in a test situation, while no such form in perception was concretely given to the subject in the conditioning situation or the original experience. When verbal instruction with one experience or a one-letter word with one figure was given to the subject in the conditioning situation following the image conditioning procedure, Corn-Becker, et al. (2) reported on the experiences or visual images in the test situation corresponding to the verbal instructions or letter words which were not directly given to the subject in the conditioning situation.

This type of conditioning, based on generalization, has been called "abstract conditioning" (1). Their experiment is, perhaps one of the most ingenious experiments concerning human conditioning of concept or meaning. It may be expected that if one should utilize the image production technique in PHHS (6, 7, 10, 12) a more detailed and thorough consideration of such an abstract conditioning of the second effect on image may be possible. The problem in this paper, then, is as follows:

Can the abstract image be reproduced by the secondary or abstract conditioning procedure or not? I.e. can the abstract image, which is ruled and determined by the secondary effect or meaning, in the test situation, be reproduced or not after the conditioning situation in which no other than the stimulus figure is concretely given to the subject? If this can occur, a theoretical consideration of the image form can be made under a simple condition of human experience.

2. Condition of Number

Since number is the simplest and most common of abstract concepts in our daily life, the first consideration of abstract image is made in conditioning of number to the number sounds.

Conditions: Three different numbers of intermittent buzzer sounds were used as the conditioned stimuli (C.S.); one, two and three sounds. The duration of one sound was about 1–2 seconds. The intervals between

sounds within each C.S. were 0.3–0.5 seconds. Three white cards (150 × 100 mm²) on which one, two or three circles (r = 7 mm, 1 mm in width) were drawn up in a row at equal intervals of 20 mm between the centers of each circle and in the middle of each card were used as the unconditioned stimuli (U.C.S.); the experimental procedure was divided into two parts; one was the conditioning situation in the hypnotic trance, and the other was the test situation in PHHS. The experimental conditions in the conditioning situation were: (1) single conditioning, (2) differentiated conditioning and (3) context conditoning. In the single conditioning, one U.C.S. was conditioned to a single C.S.: one circle card as U.C.S. was conditioned to one sound of buzzer as C.S. In the differentiated conditioning, two pairs of conditioning were made to differentiate each other; one circle card to one sound, and two circle card to two sounds. In the context conditioning, three pairs of conditioning were made; one circle card to one sound, two circle card to two sounds and three circle card to three sounds respectively. In the test situation the experimental procedure is the same through the above three kinds of conditioning. At first, giving one sound, the experimenter asked the subject to observe and report the image. Next, giving two sounds, the experimenter asked the subject to report the image. In the same way, giving three, five and eight sounds, the subject was asked to report the image each time. Such a series of the above procedure (one–eight sounds) was made two or four times in random order in one test situation. The number of sounds is indicated by dot-sign, for instance "—", the ones of circles on card by circle-sign, for instance "00"; all of the above mentioned procedures are diagrammatically represented in Table 1. Since all the other conditions other than the abovementioned were the same as those in the reports by Naruse and Obonai (13), their redescription is omitted here. Ten volunteer pupils of the Dowa Middle School in Toshima, Tokyo were used as subjects. All of the subjects were required to have the post hypnotic hallucinatory image.

Results: Since the mode of image appearance in the test situation was fairly different in the three kinds of conditioning procedures, the details of results were given as follows according to each procedure:

(a) Single conditioning: The image which appeared in the test situation was influenced very little by the number of sounds. When one or two sounds were given, only one circle appeared at any time in the image. It was noticed in some cases that the image corresponding to two or more sounds appeared more clearly or in a more complete form than that to one sound. It frequently happened also that the image was more enlarged or contracted in the case of one sound than in that of two or more. In spite of these facts, no difference was perceived in the principle

TABLE 1

Diagramatic Representation of Whole Procedures in Each Experimental Situation on the Conditioning of Number

Experimental situation / Experimental condition	Conditioning situation		Test situation
	C.S. (buzzer)	U.C.S. (circle)	(buzzer)
Single conditioning	–	○	
Differentiated conditioning	– – –	○ ○○	– – –
Context conditioning	– – – – – –	○ ○○ ○○○	– – – – – – – – – – – – – – – –

of image reproduction between the case of one sound and that of two or more by ten subjects. This fact may tell us that the number of buzzer sounds does not have any significance to the subject other than the reinforcing, enlarging, or contracting effect on the image.

(b) Differentiated conditioning: In the test situation after the differentiated conditioning, a difference in image reproduction between the case of one sound and that of two or more was distinctly perceived. In cases of three, five, or eight sounds, the number of image circles was two; the same as that of two sounds. In the exceptional cases, one image circle appeared corresponding to one, three or five sounds, and two circles or two or eight sounds. Table 2 shows a distribution of subjects in percent by four trials with regard to the relationship between number of sounds and number of image circles. This table indicates that in general a single sound recalls a single circle, and plural sounds recall two circles.

TABLE 2

Distribution of Ten Subjects in Percent by Three Trials of Differentiated Conditioning with Regards to the Relationship between Number of Sound and Number of Image Circle

Number of buzzer sounds / Number of circle images	1	2	3	5	8
No or very vague	5	10	10	10	20
1	90	10	30	30	10
2	5	70	50	50	70
3		×10	10	10	

For two, three and five sounds, one exceptional subject reported a three circle image of which two circles were clear while the other circle was very vague. Moreover, he described the vague circle as follows: "I cannot tell exactly the number of the vague circles, and I wonder whether there is only one, or more." The result of this experiment indicates that one, two or more sounds get a meaning to subject to differentiate the single and plural, or odd and even numbers in the image reproduction. This is why the author calls the procedure to bring such a differentiation, the differentiated conditioning.

(c) Context conditioning: In the test situation, after the context conditioning, one image circle appeared corresponding to one sound, two circles to two sounds, and three circles to three sounds, being in accord with the experimenter's expectation on the basis of previous experiments. Furthermore, new phenomena were found in some subjects of this test, namely, that five circles appeared corresponding to five sounds, and eight circles to eight sounds. Because of the fact that five or eight circles were not given to the subject in the conditioning situation in the subject's direct experience, it may be said that those images are created originally by the subjects and then they appear as the abstract images according to Corn-Becker's terminology. Through the test, it was confirmed that the numbers of image circles other than five or eight, for example four, six, seven or nine, were reproduced by the subjects fairly well, at the experimenter's will through the specific number of sounds. While this additional test was made too unsystematically to report it quantitatively, it may suffice to verify the reproductivity of such an abstract image.

A more detailed examination is made here, on the images corresponding to the five and eight sounds. Two subjects did not report any abstract image as shown in (A) and (B) of Fig. 1; reporting one, two or three image circles very correctly and clearly in accord with one, two or three sounds, they saw no image corresponding to the number sound five or eight. One of them was the exceptional subject, who reported also no image corresponding to three sounds in the differentiated conditioning. The other was the subject who reported in the differentiated conditioning, not one circle, but two circles corresponding to three, five and eight sounds. Those two subjects were put in a deeper trance, and they reported very clear images. The above facts may indicate that the more correct the image which corresponds to that of direct experience in the conditioning situation the more difficult the production of abstract image.

There were various modifications in the abstract image as shown in Fig. 1. There were the cases as (C), and (D) in Fig. 1 in which correct

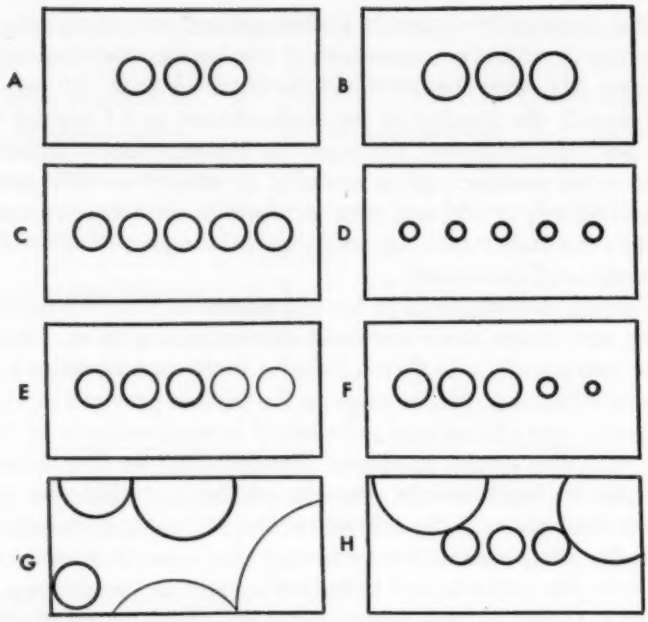

FIG. 1. Illustration of typical modes of image modification which was reported to five sounds.

and clear image circles appeared evenly in a row. On the other hand, there were the other cases as (E), (F), (G) and (H) in Fig. 1, which were distorted or modified from the original. In such an image type as (E), while the first three were the same as the original, and clear, the remaining circles were clear but contracted. It seems that three correct and clear circle images in (E) and (F) correspond to the original perception given in the conditioning, but the remaining part of the image was influenced by the construction or fabrication of the subject's inner work. It happened in general that subjects drew the first three circles directly and vividly but the other circles hesitatingly, saying "they are too vague to copy on paper". Figures (G) and (H) illustrate the cases in which the images were more vague and incorrect. Most subjects who reported, (G) or (H), could not copy positively, and were at a loss saying, "I see so many circles that I cannot copy all of them correctly", or "I cannot count all the circles, so I will try to copy in a hit-or-miss fashion". The modes (G) and (H) are the attempts by the subjects when they were asked forcibly to try to copy in spite of their hesitation to draw. While the outline of such circles is uncertain, and the forms differ very much from the original, generally, the number of circles corresponds correctly to the number of sounds. Since the other modes of

TABLE 3

Distribution of Ten Subjects in Percent by Three Trials of Context Conditioning with Regard to the Relationship between Number of Sounds and of Image Circles

Number of buzzer sounds / Number of circle images	1	2	3	5	8
1	100	13	3	3	3
2		80	20	3	3
3		7	67	20	20
4			10	7	
5				54	
6				7	4
7				3	10
8					40
9–over					14
No image				3	6

distortion of image were the same as that of our previous reports, redescription is omitted.

The clearest image was that of (A) or (B) in Fig. 1, in which they failed to make the abstract image. The next in order of image clearness was that of (E) and (F) in which the abstract images did not appear clearly. The third in order was that of (C) and (D) in which the abstract images were equal in clearness and in form to the original ones. The most obscure image was that of (G) and of (H) which were correct in number, but not in form. It seems that the depth of the hypnotic trance corresponded to the clearness of image as a rule. The subjects who reported (A) and (B) were in the deepest trance in this experiment.

Table 3 shows the distribution of three trials by ten subjects in percent with regard to the relationship between the number of buzzer sounds and that of image circles. All of the subjects reported one image circle corresponding to one sound and when two sounds were given, most of the subjects (80%) reported two circles, but a few reported one circle or three circles. In the case of three sounds, the deviation in image corresponding to sounds was more conspicuous than in the case of two sounds. When five or eight sounds were given, a correspondence between number of sounds and that of circles was more diffuse. From the above facts, it may be said that the greater the number of buzzers or circles, the more incorrect becomes the corresponding relationship.

With regard to such an incorrectness of buzzers and circles, it may be inferred that the subject grasped the number incorrectly or uncertainly.

As to the cause of such a misconception of number, we may consider two: one is that the greater the number of sounds, the more difficult is the correct grasping of it. As stated in the author's previous paper (12), the subject does not generally pay attention to the sound consciously, in spite of the fact that the image is induced by the sounds. If he attends to the sounds, the image may leave him. To observe the image, then, he takes a passive attitude consciously and must listen to the sound absent-mindedly or subconsciously. Besides such a request, in this experiment, he must subconsciously count the number of sounds. It may be said that however easy it is to count the number of sounds in normal consciousness for the age levels of my subjects, the counting may be a fairly difficult task in subconsciousness. If this is true, the greater the number, the more difficult the counting and the more apt the subject is to make a mistake. If the number of image circles corresponds correctly to the result of his counting, then the mistake in counting will express itself in the number of image circles. Another cause of misconception of number may be that because of the vagueness of the image itself, the subjects could not grasp correctly the appearance and number of image circles. If such is the case, in spite of the fact that he is able to count the number of sounds correctly, and that image circles appeared in correct number, it is naturally difficult for him to report or copy them correctly. Because of the above two reasons, it may be inferred that the greater the number of sounds or of image circles, or the more vague the image, the more diffuse the correspondence of number of sounds to that of image circles, and the less likely is the appearance of the correct abstract images.

3. Conditioning of Numeral Letter

Utilizing the experimental result of conditioning with numbers, a consideration is made in the case where numeral letters are used in UCS. If some numeral letters as UCS are conditioned to each number of sounds as CS in the conditioning situation, and if abstract images are experimentally possible, it may be expected that an image of a numeral letter, which was not given directly, may appear to the subject in the test situation.

Conditions: Three numbers of buzzer sounds were used as CS; one, two and three. Three kinds of numeral letters which were drawn on white cards (80×80 mm^2) in China ink, were used as UCS; 1, 2, and 3. In the same procedure as that of context conditioning in the conditioning of number, three kinds of paired conditioning were made to the subject in a deep trance; letter 1 was conditioned to one sound, letter 2 to two sounds and letter 3 to three sounds. The procedure in the test situation was divided into two parts: (a) the massing test and (b) the grouping

test. At first, the massing test was made, then the grouping test was made on the same subjects. In the massing test, whole buzzer sounds were given in even quality and even interval within each CS, in the same manner as in the previous experiment; one, two, three, five and eight. Each CS was given at random, and three trials were made. In the grouping test, four kinds of sound interval were given; "– ––", "–– –––", "–––– –––", and "– – –". Since the grouping test was incidentally used, the experiment was not exhaustive, nevertheless the result is very interesting. Ten new pupils served as the subjects.

Results: Though one and the same cases were noticed in the massing test and in the grouping test, for the sake of clear consideration of results, the description is divided into two parts.

(a) Massing test: Being given one, two, or three sounds in the test situation, subjects reported generally, in the same manner as in the case of context conditioning, the visual images of numeral letter 1, 2 or 3 corresponding to each number of sounds. The images of numeral letter corresponding to five or eight sounds were divided into two groups; (1) mass image and (2) group image. The former includes such an image as 5 or 8. The latter does such repeated image as "3 2" corresponding to five sounds, and "3 3 2" to eight. Since in this experiment, the subjects who had good imagery were selected, there were few who reported mingled or distorted images as in the previous papers (12, 13).

(1) Mass image as 5 or 8 appeared in the same clearness and in the same size as that of 1, 2, or 3 in some cases, but in other cases appeared more vaguely and bigger or smaller. At any rate, it is unquestionably the case that the abstract image of numeral letter 5 or 8 could be produced by sounds five or eight. Some subjects, furthermore, who reported on the abstract images, knew that such images were of the numeral letters, but other subjects could not tell or were not aware of any meaning of image form. Reporting the image, the former subjects said "this is a letter 5" or "I see a letter 8." The latter did not answer positively to the experimenter's question "what is this form?". One subject of the latter type, for instance SZK, reported his image to five sounds by drawing the letter 5. When the experimenter asked her the meaning of the image, she again traced blankly her reported letter with her pencil saying "What is this? It is a very queer form. Maybe this is an upside-down letter 2." Next time to five sounds, she drew a letter 2 more adequately in reversed form of the first time saying, "This is 2 in upside-down letter." For the third repetition of five sounds, she reported a letter 5 correctly, apart from the previous reports of letter 2. From such a fact, it may be inferred that she saw only a form of abstract image 5, but was not aware of the meaning or of the abstracting work of her subconscious.

The subjects who were in the deeper trance than that of subject SZK, failed to report the abstract image itself. Some of the subjects reported at random the letter 2 or 3 corresponding to five or eight sounds. The others reported no image in spite of the fact that they saw a clear letter 1, 2, or 3 in image, to one, two or three sounds. Some of the subjects who were in a lighter trance did not know the meaning of the image saying, "I think I see something like a numeral letter 5," while their images were too vague to report or to copy correctly. And some in lighter trances created the abstract letter saying "It must be such a form, for it is eight in count". Such a relationship between the depth of trance and the appearance of the abstract image is the same as that stated in the author's previous papers. In the case of complex image, there were two contrasting types; the understanding type and the rote one (12). In the case of image composing, two types were discriminated; the integrated image and the overlapped one (13). And the deeper the trance, the more frequent the latter type image, while there was less distortion or modification. In the present experiment, the deeper the trance, the more difficult it was for the abstract image to appear. The author also had experimentally found that the deeper the trance, the less effective the "meaning" which was an important factor in modifying the image (13). The present experiment, too, indicates that the effect of abstraction works more conspicuously on the image in the medium or lighter trance, but with difficulty in the deeper trance. It may be that in the medium, or light somnambulistic trance, the image creation is more active and more free than in the waking state, whereas in the deeper somnambulistic trance the clearness of image is less than in the deep trance. We must now, regarding image activity, distinguish the creativeness from the clearness in image formation. R. W. White (18) and F. R. Sarbin (17) attempted to characterize the hypnotic trance as the vivid activity in imagination of the subject, in their ingenious insight into hypnosis. But from the result of the present experiment on the abstract image, it must be said that with deeper than medium trance, the less creative the image and in contrast, the more clarity of image. M. H. Erickson (3) distinguished, in the deep trance, the stuporous trance from somnambulistic trance, and characterized the former by the primary passive responsible behavior, marked by both psychological and physiological retardation. From this experiment on the abstract image it would seem to support his theory indirectly.

In this experiment, as in the case of context conditioning of numbers, the numeral letter-image correspond to number of sounds, for instance 4, 6, 7, or 9, etc. The author inferred two causes for lack of corresponding number of circle images to number sounds; one was the error of

counting the number of sounds and another was the error of copying the correct images. The latter cause may operate with many circle images, but in this experiment in which the subject is to observe a single letter image, it should be comparatively easy to observe a single letter image, with the exception of a few special cases (as the subject SZK). The cause of misconception, then, may be the counting error of sounds. If a subject counts eight sounds as seven or nine, the subject may see the numeral letter 7 or 9 in image. Concerning the image letter 7 or 9 which did not correspond to the given number of sounds, and which was caused as a result of wrong counting, we could not infer any other reasons for its occurrence than the above. It may be said that such images are due indirectly to the productivity of abstract image in numeral letter form.

The style or form of abstract letter-images was very diversified. The image 1, 2, or 3 appeared in the same style as that of UCS, but that of 5 or 8 might be varied by each subject's conception of letter, or be created by his own graphology. However, it is not certain at present whether such an abstract image-form appeared in the image itself or was copied out in a peculiar form because of his graphology.

(2) The group image is a collective image in which were arranged two or three numeral letter-images. They were, as a rule, given to the subject as CS in the conditioning situation. The group image was clearer and was reported by the subjects who were in deeper trances than the subject who reported mass image. If three letters were arranged in a row in the same magnitude as that of the original letters, they could not be contained within the observing frame or card. But the subject was not aware of such a contradiction. Naruse and Obonai reported on the same fact in their experiment (10, P34) on image composition. Thus, it seems that such a phenomenon may be a fairly general one in image production. There were images in which the first letter was big, the next was small, and the third still smaller, and so on. Furthermore, there were images in which the letter images appeared variously in their own clarity or magnitude. However, nothing can be said conclusively of their modes of variety, because of the insufficiency of experimental data.

Other than the above-mentioned images, there were the subjects in deeper trances who reported that the group images were composed of an image repetition of originals, 1, 2, or 3 which were given in the conditioning situation, and reported no other images. There appeared, in addition to the above, many irregular images, as in the previous experiment. Table 4 shows the results of five trials in percent regarding the relationship between letter images and number of buzzer sounds. This indicates as does Table 3, that the fewer the number of buzzer sounds, the less conspicuous the variety or misconception. Comparing Table 4

TABLE 4

The Result of Ten Subjects by Five Trials in Percent with Regard to the Relationship between Letter Images and Number of Buzzer Sound

Modification of image \ Number of sounds letter image		1	2	3	5	8
Single image	1	100	6	4	2	2
	2		90	14		
	3		4	80		2
	4			2	4	
	5				53	
	6				2	2
	7					4
	8					42
	9–over					6
Repetition of image	3 2				21	
	3 3 2					18
	others				10	12
No image					8	12

with Table 3, we see that the images corresponding correctly to number of sounds in the former were more conspicuous than in the latter.

(b) Grouping test: It seems that the group image, in the massing test, for instance "3 2" or "3 3 2", is caused by the subjective grouping of homogeneous five or eight sounds to "— —", or "— — —". If this inference is true, such a group image, for instance "2" or "3 3 2", may be experimentally evoked by sound grouping of CS at will, for instance "— —", or "— — —". From this standpoint, the grouping test was attempted.

The result of the grouping test indicates clearly that the group image was gained corresponding to the grouping sounds. Now, the images corresponding to group sounds are divided into four groups; (1) correct repetition which correctly corresponded to such a grouping, (2) wrong or miss repetition which did not correctly correspond to the grouping, (3) abstract image which related to the total or whole numbers of sounds and (4) single or no image. Table 5 shows the result of four trials in percent with regard to those images and grouping sounds. This table seems to indicate that the group image is determined from the modality of number grasping or sound configuration (or Gestalt) within the subjective inner perception. It may be said that those images as "5 3" are

TABLE 5

Result of Ten Subjects by Four Trials in Percent with Regard to Four Kinds of Images and Grouping of Sounds

Group sound / Numeral letter in image	"– –"	"– – – –"	"– – – – – –"	"– – –"
1 2	55			
2 3		65		
5 3			40	
1 1 1				40
Wrong or miss repetition	10	15	25	5
Abstracted by whole number	30	10	15	50
Single or no image	5	10	20	5

included, in the long run, in the category of abstract images as a repetition of abstract images.

IV. Conditioning of Verbal Sign

In the above experiments, a set of conditioning of figural circles was made to nonsense sound by means of the context or abstract conditioning, which is a sort of signification or categorization within the subject. As a result, it was found that the abstract image was produced corresponding to the subjective meaning of the indifferent sounds as CS. If, on the other hand, the verbal sign, which gained by itself a specific meaning in his past experience, was utilized as CS, then the abstract image was more easily produced than in the case of nonsense sounds. To test such an inference, the following procedure is attempted in the next experiment; after a set of image conditioning of letter or letters as UCS to verbal sign or instruction as CS in a manner that the indications of letter and verbal sign were semantically corresponding to each other, the natures of produced images especially of the abstract images, were considered, giving some optional verbal signs which were originally meaningful recalling mediums. Here two kinds of experiments were attempted; (1) conditioning of numeral letters and (2) conditioning of alphabetical letters.

(*1*) *Conditioning of numeral letters*

Conditions: A CS subject was given three verbal signs "one", "two" and "three"; a UCS, three numeral letters which were used in the previ-

TABLE 6

Modification of Images of Seven Subjects by Two Trials from Four Kinds of Verbal Signs

Verbal sign / Image	"one"	"two"	"three"	"five"	"eight"
1	100				
2		100			
3			100	8	15
5				71	
8					64
No image				21	21

ous experiment, i.e. in the context conditioning of numeral letters; 1, 2, and 3. In the test situation, five kinds of verbal sign (suggestion) were given to the subject; "one," "two," "three," "five," and "eight." Seven pupils served as subjects.

Result: In this experiment, the nature of the abstract image was more distinctly disclosed than in the case of nonsense buzzer sounds. Only three categories of images were found: (i) abstract image (mass image), (ii) original image (1, 2, or 3 image), and (iii) no image. There was no group image. Table 6 shows a distribution of four trials of seven subjects in percent in the same manner as Table 5. The table indicates that the abstract image is distinctive, but various modifications of abstract image, as in the case of buzzer sound, did not appear. Three exceptional subjects saw no image for "five" and "eight," while they reported correct and clear images 1, 2, and 3 for "one," "two," and "three," of verbal signs. It will be seen from the table that the image figure 3 appeared in fifteen percent of trials through "eight." This was most likely due to the fact that the image is so ambiguous that the subject could not discriminate for certain whether the form of image was 3 or 8. From these results, it may be said that the conditioning by verbal sign is more favorable for producing the abstract image than conditioning by buzzer sounds.

(2) *Conditioning of alphabetical letters*

Conditions; The 14 subjects were divided into two groups; (a) single conditioning group, and (b) differentiated conditioning group. In each group there were seven subjects. For the former group the subject was given a letter "A" which was written on the white card (80×80 mm^2) as UCS conditioning to a verbal sign "ei" as CS. For the latter group, two letters "A" and "S" were given with two verbal signs "ei" and "es". Then, one pair of conditioning was made to the former, and two pairs were made to the latter. In the test situation, the procedures were the same

TABLE 7

Modification of Images by Two Trials of Verbal Signs from Fourteen Subjects

Group image	Recalling stimulus	"ei"	"es"	"bi:"	"kei"
I	correct	86	86	50	57
	similar	14	14	28	29
	other			14	7
	no			8	7
II	correct	86	44	58	36
	similar	14			
	other		28	14	28
	no		28	28	36

for both groups: four kinds of verbal signs "ei", "es", "bi" and "Kei" were given to the subjects.

In addition to the present experiment, an analytical study of abstract image was made on the case of Kana letter (Japanese alphabet), and some interesting results were obtained but detailed description is omitted because of the handicap of language.

Result: The images corresponding to verbal signs in the test situation were classified in the following four categories: (1) correctly corresponded, (2) similar form, (3) irrelevant form, to each indication of verbal sign, and (4) no images. The similar forms include for instance, those of "3" or "B" corresponding to "es"-sign, and "H," "N," or "R" to "kei." In the category of irrelevant form, strange forms of image, corresponding to the form or indication of verbal sign, were classified. Table 7 shows the modification of images for two trials of verbal signs. From this table, it can be seen that the images "A" and "S" correspond to the verbal signs "ei" and "es," the abstract images "B" and "K" were seen by "be" and "kei," as in the case of buzzer sounds. This is true not only for the differential conditioning group but also for the single conditioning one. In the case of the buzzer, context conditioning was necessary, but in the case of verbal sign, it was sufficient to have differential, or single conditioning, to gain the abstract images at will. This fact indicates that the abstract image is more easily produced by verbal sign than by other nonsense signs.

In the single conditioning group, similar forms to the indication of signs is more and no image is less, than in the differential conditioning group. This comparison indicates that the abstract image is more difficult to be made by single pair conditioning than by double pairs. As stated in the previous experiments, more vague, smaller and more distorted images are apt to appear in the abstract image (B or K) than in the

image of the original form (A or S). Some subjects in deep trance could not tell the meaning of the image, although they saw correct and clear images as stated previously. In Japan, since the pupils learn the Roman alphabet for the first time in the Middle School, they are not familiar with such letters. As a result, it was more difficult to gain the abstract image of a Roman letter than that of Kana letters. It would be interesting if a comparative study were attempted along similar lines with pupils who are familiar with the Roman letters in their daily life.

Summary

In the present paper, the experimental production of abstract image in PHHS was examined by the image conditioning method in a hypnotic trance. The comparison of conditioning procedure was made between the buzzer sound or verbal sign as CS, and circle, numeral letter, or alphabetical letter as UCS. The main results of the study are as follows:

(1) To evoke at will the abstract image, it is necessary to establish a corresponding relationship between the context of Cs and that of UCS by a conditioning method.

(2) To establish the corresponding relationship, it is necessary to use the context conditioning procedure and not the single or differentiated conditioning.

(3) In establishing the context conditioning, the more meaningful the stimulus used, the easier the relationship, and vice versa. The context conditioning is more easily accomplished by verbal signs than by buzzer sounds in CS and by numeral or alphabetical letters than by circles in USC.

(4) When the trance is too light, it is difficult for the post hypnotic image to appear. On the other hand, when the trance is too deep, while the image is clear and like the originals, the production of abstract image is difficult. The abstract image is, therefore, most easily produced in a middle or somnambulistic trance state between the lighter and the deeper trance.

(5) The greater the number, the less certain or the more difficult the subconscious operates, especially in counting, for the hypnotic subject. It is assumed that the accuracy of subconscious, spontaneous counting is generally lower than that in consciousness.

(6) All of the relative workings in order to produce the abstract image, were made in the subject's subconscious and even though the abstract image was achieved correctly, the subjects in normal consciousness or in the post hypnotic hallucinatory state were not generally aware of how or why it was formed, or what meaning it had.

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COMMENT ON A THEORY OF HYPNOSIS

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Recently, a paper on a working hypothesis as to the nature of hypnosis was published by Meares (2). In it, he is critical of a theory of hypnosis which I offered not long ago. He quotes my theory as follows: "The hypnotic state, in terms of its basic ingredient, is that condition represented by the most primitive form of psycho-physiological awareness of individual-environmental differentiation attainable among living organisms." These words appeared in the summary I presented in the original paper on this theory (3). The sentences that follow in the summary are these: "The capacity to move in the direction of functioning which would bring to the fore this most primitive state to the greatest degree possible probably varies among different organisms. The retention of some degree of such capacity probably obtains among all biological forms." The views expressed by Meares on the nature of hypnosis based on his own experience and thinking were of special interest because, instead of detracting from the theory I had proposed, they appeared to support it. Let us examine this paradox more closely.

A specific label was not attached to the theory although it is in a sense psychophysiological or more inclusively, biological. It was pointed out originally that a basic fallacy in most theories is their tendency to focus essentially on hypnotic induction and on phenomena that can be elicited, rather than on the essence of the hypnotic state itself. For the basic ingredient of the latter, it seemed pertinent to concentrate on that condition most removed from the "ordinary waking" and the sleep states as we know them. Whether self-hypnotically or hetero-hypnotically induced, this condition, in its most pure form, is reached when the usual thinking processes associated with conscious awareness are altered to a degree that contact with the environment is markedly reduced and the hypnotic subject experiences the minimum of self-awareness of which we can conceive, and, as a corollary, the minimum degree of differentiation of his "self" from the "environment", insofar as this is possible. The extent of dissipation of environmental contact would be even greater than, at the very least, the absence of an awareness of time, place, and person. It was stated further that "When this condition is attained, the individual has moved in the direction of functioning approaching the most primitive level of psychophysiological functioning of living organ-

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isms where the very first note of awareness of individual-environmental differentiation occurs. According to the theory now proposed, this basic psychophysiological differentiation of individual and environment is the essence of the hypnotic state, and as such is in fact the state which we have of late termed hypnosis. . . . This biological (psychophysiological or whatever term may be deemed most closely descriptive) theory of hypnosis does not discount the possible validity of evidence accrued under various headings of complex psychological, sociological, physiological, or other approaches to the theory of hypnosis. My belief, however, as stated before, is that these theories relate more to the operational and phenomenological aspects of induction or behavior during various levels of psychophysiological change that are reached along the line of the *continuum* from the ordinary waking or the sleep state, to the hypnotic state in its most simple, basic, or primitive form as described above.

"It is indeed of interest that during the course of whatever functional alterations ensue as the individual (we may think of human subjects because most of what we know about hypnosis pertains to them) moves into various 'levels' of hypnosis, a variety of complex forms of functioning may ensue spontaneously or be heterohypnotically induced. Admittedly our understanding of this is very incomplete, and such understandings undoubtedly relate to a variety of complex neuropsychological, sociological and other issues. These issues, however, have in my opinion confused the answer as to the basic ingredient of hypnosis and I am at present inclined to view the hypnotic state in its most primitive biological terms as outlined above."

After the proposed theory of hypnosis had been issued, I published a paper on hypnosis-death and hypnosis-rebirth concepts, with related issues (4). It was possible to integrate some of this material with the theoretical proposals. For present purposes, pertinent comments on the hypnosis theory are as follows: "Aside from a few other points stated in connection with the theory, it should be added now that the primitive condition believed to be hypnosis, in accordance with this theory, would actually constitute a state somewhere between organic and inorganic existence. It would constitute a primordial state constituting a substratum for later development of more complex life experience, and as such the basic ingredient of the hypnotic state would apply to all living organisms rather than being limited to man. . . . The ideas involved here suggest that the primordial state referred to is one wherein conceivably there might be a reversible process with an inorganic state at one extreme and organic existence at the other. Remnants of this state might possibly, if the state is indeed valid, influence the nature of complex

symbolic thought, feeling and behavior touching on this theme.... If the term regression is used in relation to a reversal of developmental continuum, then the basic ingredient of the hypnotic state, in keeping with the current theoretical formulation, would imply a transcendence of chronological age-year regression and would include ontogenetic and phylogenetic regression, too."

It should be clear, I believe, that the proposed theory strives to identify the core of hypnosis and to utilize this core for the essential framework in a simple, definitive form. The complex issues of hypnosis, insofar as they fit the structural framework, fill the spaces. The point emphasized regarding the complex issues is that they constitute the psychological, physiological, sociological, and other elements pertaining to hypnosis (5). These elements have been utilized in the formulation of other theories (6). As a result, there are many theories which seem to supplement one another, without overlapping significantly, and without furnishing a common denominator for the various points of view. I have attempted the proposal of such a common denominator. In doing so, clarity and simplicity were the goal, and I think these have been approached because the complex embellishments, valid as they may be, can be penetrated while achieving fundamental substance.

After dealing with theoretical concepts of Mesmer, Braid, Charcot, Liébeault, Bernheim, Freud and Ferenczi (7), Meares went on to say, in his discussion of the nature of hypnosis, that recent investigators have abandoned simplicity and have presented theories so complex that clarity is often obscured (2). It is in this connection that he mentions my theory of hypnosis. He makes similar reference to concepts published by Guze (1). It would seem that a careful appraisal of the points of view I have outlined tend to highlight the representation of the nature of hypnosis in a way that contradicts Meares' criticism. Our goal on this score, and the effort to reach it, is the same.

Dealing with his theoretical views on hypnosis, Meares stresses the nature of suggestion, verbal and non-verbal. This appears to be a fundamental concern for him, but his thinking does not involve the superficial, over-simplified ideas so often encountered. Speaking of suggestion as an archaic mental function, Meares writes, "In the evolution of man, the ability of logical thought is taken to be a recently acquired mental function. In primitive man, before the evolution of logical processes, it would seem that simple ideas must have been accepted by some other, simpler, mechanism. It seems that suggestion is the process which fulfilled this function. In other words, suggestion is taken to be a primitive mental process which acted to determine the acceptance of ideas in the evolutionary period prior to man's acquisition

of the ability of logical thought. If this be so, one would expect to find evidence of the process of suggestion in the acceptance of ideas in the human infant, in primitive man, and in sub-human animal species." It seems to me that Meares' ideas in this connection are quite consistent with the phylogenetic aspects of my theory as outlined already. After commenting on some aspects of the behavior of the human infant, Meares says, "It seems that, in his imitative phase, the infant reenacts his heritage from distant ancestors of the time when suggestion ordered the life of his forebears. The primitive process of suggestion is active in infancy and childhood, only to be superseded by reason in adult life." These views appear to integrate the phylogenetic and ontogenetic attributes of hypnosis, as I have also proposed. The difference is the all-inclusive quality of the biological view that I presented, stressing hypnosis in a basically holistic sense. Meares emphasizes one particular component of this holistic view when he offers an opinion of "hypnosis as regression to archaic mental function of suggestion," and says, "This concept that suggestion is an archaic mental function can be used to explain the nature of hypnosis."

I agree with Meares that none of the present theories explains all of the phenomena of hyposis. A detailed evaluation of my own proposal has yet to be presented in a more thorough and conclusive form although as I read theoretical accounts by others as they appear, it seems as if they can fit without conflict into the framework already outlined. The attention to the regressive aspects of hypnosis as Meares has proposed is quite in accord with my views except for his concentration on the issue of suggestion and the area of mental functioning. I feel that the biological view I have described encompasses and goes beyond this point in a way that is significant for inclusion of the phylogentic component of theory. For example, Meares says, "It is shown that suggestion is particularly active in the human infant, in primitives, and in sub-human species. From this it is argued that suggestion is an archaic mental function which in past evolutionary periods has been the main means of interpersonal communication." If the evolutionary concept is pursued, life forms are reached where primitive behavior encompasses reflex types of reactions and their variants, or similar forms of mechanisms comprising a physiology or psychophysiology in which the very issue of suggestion, non-verbal though it be, is no longer applicable. In other words, the suggestion theory can go just so far, but not far enough.

It is curious that in psychotherapy and in psychological experimentation, the hypnotic aspects of human behavior, despite the elements that we categorize as regressive, give rise potentially via the regressed

state to possibilities for greater self-understanding, reorganization of psychological functioning, and, as a seeming paradox, additional personality growth. This paradox is compounded further by special enlargement of the blind spot among many who fully accept the regressive elements in certain aspects of the transference peculiar to the traditional psychoanalytic setting as a potential stepping stone to later personality maturation, but decline to view them hopefully and unemotionally in the hypnotic interpersonal contact.

Allowing for differences in the over-all view of the totality of the regression at the core of hypnosis, I should say that Meares and I agree on the idea of other elements in hypnotic functioning constituting secondary considerations superimposed on the essential regression. He mentions the overlay of psychodynamic mechanisms, with specific reference to hysteroid defense, identification and transference. The involved and complex characteristics of a large variety of hypnotic settings serve as an extension, I believe, of what he terms this overlay. I concur that such features disguise the core, and our differences regarding the latter have already been discussed. Thus, in many theoretical expositions, the facts aligned to support them can readily be substantiated, but the conclusions have limited scope because they are based on secondary elaborations in hypnotic involvements rather than, in my opinion, the primary biological considerations.

Summary

I presented, in previous reports, a holistic, biological theory of hypnosis which emphasized the core element in the nature of hypnosis, to which other theoretical propositions appear to serve as embellishments and secondary detail, valid as the various observations may be. The proposed theory states, "The hypnotic state, in terms of its basic ingredient, is that condition represented by the most primitive form of psychophysiological awareness of individual-environmental differentiation attainable among living organisms." An explanation of the theory, its ramifications, and the ontogenetic and phylogenetic implications have been disclosed elsewhere. Meares regarded the theoretical proposal as too complex, with clarity obscured. A review of the material tends to affirm the opposite, I believe. Meares presents his own ideas regarding the nature of hypnosis as a regression to the archaic mental function of suggestion. Suggestion is recognized as verbal and nonverbal. The ontogenetic and phylogenetic features of this concept are included among other ramifications of his discussion. I have offered the opinion that Meares' ideas about hypnosis do not contradict my theory. On the contrary, his experience is quite consistent with the

theoretical concepts I have offered, and his understanding of the nature of hypnosis fits in quite easily with my own. His stress on archaic mental function is not, however, as far reaching as the proposals I have made, but it does constitute one proper aspect of the broader spectrum of hypnosis. Of this there is a definite core as outlined. Secondarily, there are manifold, complex, superimposed ingredients and embellishments with psychological, physiological, and sociological determinants.

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THE Y-STATE—AN HYPNOTIC VARIANT

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Hypnosis involves a changed state of consciousness. In a general way, we often come to regard the state of consciousness in hypnosis as something uniform. We are inclined to contrast it with other states of consciousness such as sleep, or the waking state. However, clinical experience shows that the state of consciousness in hypnosis is by no means uniform, and in the ordinary medical use of hypnosis, two quite different states of consciousness can be distinguished, each of which is used for different purposes.

Hypnotic sleep has all the outward appearance of natural sleep. The subject is oblivious to all that goes on around him, but remains alert to everything that the therapist says. This is the state of consciousness which is induced for the therapeutic use of hypnotic suggestion. The feature which is significant to the present discussion is that hypnotic sleep is a state of consciousness in which the subject initiates neither psychic nor motor activity. It is a state of complete passivity.

In contrast to hypnotic sleep, there is another variety of the hypnotic state which involves quite a different state of consciousness. For convenience, we will refer to it as the state of hypnotic activity. In it, the patient talks spontaneously and moves spontaneously. He may express himself by graphic or plastic means if he is given suitable materials. In hypnotherapy, this state of hypnotic activity is used in abreaction and in the uncovering techniques of hypno-analysis. In this state, the activity is essentially uncontrolled, and unrelated to present reality.

There is, however, another form of hypnosis which involves quite a different state of consciousness. In it there is a state of abstraction which is consciously produced and maintained by active effort of will. Thought may be focussed with extreme intensity on some particular idea. The intensity of this thinking and exclusion of extraneous stimulii distinguish this form of hypnosis from normal waking consciousness. There is a semblance of hypnotic sleep, but the active and controlled cerebration during the process clearly distinguishes it from both natural and hypnotic sleep. Likewise this form has some semblance to the active forms used in hypnoanalysis, but as the activity is controlled

by act of will, and concerns only the patient's subjectivity, it is easily distinguishable from these. This form of hypnosis is little used in Western medicine. It is a Yoga-like state; and for simplicity I shall refer to it as the Y-state.

There are two obvious reasons why the Yoga approach to peace of mind is unacceptable in Western society. In the first place, it demands a negation of the self and a disregard of practical reality which is foreign to the extravert way of life of our culture. Secondly, Yoga practices are explained on principles of anatomy and physiology which are scentifically untenable. Nevertheless, it would seem possible that an hypnotic variant which resembles the Yoga state may still have some value in modern psychiatry.

The author first became concerned in this matter following an examination of the way in which many patients use sleep as a defence in hypnosis. This defence is often particularly obvious when inducing hypnosis by one of the active methods such as arm levitation. The patient falls forward in a deep sleep, and thus escapes from the disturbing situation of seeing the uncontrolled movement of his arm. Similarly, in hypnography, in which suppressed and repressed material is expressed in painting, the patient often falls asleep, and so defends himself against the expression of his inner conflicts. In each of these examples, the function of sleep as a psychological defence is quite obvious, and appropriate measures are taken to circumvent the defence, so that the therapeutic process may proceed. However, it is only comparatively recently that the author has become aware that this same defence is often used by the patient in hypnotic sleep. He escapes, as it were, from hypnotic sleep into natural sleep, and thus avoids hearing the therapeutic suggestions which may appear to him as unreasonable, or as beyond his capacity. Without giving suggestions which involve the patient in some motor activity, it is not easy to determine when the patient made a transition from hypnotic sleep to natural sleep. Change in the respiratory rhythm, flushing or pallor of the face, flaccidity of the facial muscles, gaping of the jaw, and even stertorous snoring are unreliable signs, as these may ocur in both hypnotic and natural sleep. However, small movements of the body into positions of greater comfort are usually a sign of a change from hypnotic sleep to natural sleep.

If a patient has once used this defence, it has become my habit in subsequent sessions to give clear suggestions that the patient will let himself go into a state of complete and uncritical relaxation which is known as hypnotic sleep, as distinct from natural sleep. It may be necessary to emphasize to the patient that he is not asleep. "You are

not asleep; you just let yourself go; yet let yourself go completely." From this developed the idea of abstraction, of consciously developing a state of utter mental tranquility. Most patients, when they first lie down on the couch, adjust the pillow or wiggle about for a moment to make themselves comfortable. This is taken as an opportunity to explain to the patient that he can let himself go to such an extent that he is neither comfortable nor uncomfortable. He is to get beyond comfort and discomfort.

This is clearly quite a different state from hypnotic sleep or ordinary hypnotic activity. Not only this, but the means of inducing this state are different from the usual means of inducing hypnosis. In ordinary practice, hypnosis, either hypnotic sleep or hypnotic activity, is induced by one of two methods of approach. There is the authoritative approach, in which the patient is dominated and overwhelmed by the prestige and authority of the hypnotist; and there is the passive approach, in which the patient is encouraged to allow himself to drift into a state of uncritical abandonment. Neither of these approaches is applicable to the induction of the Y-state, which requires controlled mental activity on the part of the patient. In the usual passive approach, the patient is helped to abandon himself, to abrogate ego control, to relinquish the function of his will. In the induction of the Y-state, the patient is guided to use his will to actively achieve abstraction and inner calm.

This involves intense cerebration on the part of the patient, and thus distinguishes Y-state from the usual clinical forms of autohypnosis, in which passivity and abandonment are conspicuous features.

The easiest method of inducing Y-state is to first induce hypnotic sleep or hypnotic activity for two or three occasions. Full rapport with the patient is an essential pre-requisite. It is explained that he is now sufficiently advanced in the technique of hypnosis to make a change to a higher form of hypnosis. Instead of abandoning himself and letting himself drift uncritically into hypnotic sleep, he is to actively achieve a state of absolute mental calm, of complete serenity, so that he feels neither comfort nor discomfort. The patient lies on the couch as for the passive induction of hypnosis. A few verbal suggestions of calm can be given. "Feel yourself drift into greater and greater calm. Feel it all through you, all through you. Feel the calm of it in your face. The muscles of your face are calm. You feel the calm of it in your mind."

From this stage, communication is as far as possible at a non-verbal level. Words are used less and less. The full rapport with the patient allows him to interpret the therapist's behaviour in the terms

of what he has explained to him. His arm may be lifted, and allowed to fall flaccid on the couch; the blanket is pulled up, or the blanket can be tossed aside and the abdomen palpated to test the degree of flaccidity of the abdominal muscles. On the background of what has gone before, these manoeuvres have meaning to the patient. He interprets them as help and guidance in his attempt to achieve calm by exercise of his will. If necessary, the process is aided by just a few slowly spoken words. "Utter calm;" "Complete serenity;" "More and more;" "All through you." There are long pauses. When necessary, these can be broken by communicating with the patient by unverbalized phonation, by grunts and "Ums" and "Ahs." Any movement by the therapist has meaning for the patient. "He is near at hand." "He is with me." "He is helping me."

The degree of success being achieved by the patient is written on his face. The eyes soon close. There is a smoothing of the forehead, and a general ironing out of the face, with less prominence of the naso-labial furrows. The lips part, and the jaw tends to sag. There are changes in the cutaneous blood supply of the face, and changes in the respiratory rhythm. As the patient enters Y-state, the previously closed eyes often open a little. There is no sign of blinking or twitching of the eyelids. There is no movement of the eyeball. The patient is clearly in a trance. This picture of deepening inner calm is sometimes interrupted by traces of tension, as shown by a slight furrowing of the forehead, a closing of the previously gaping mouth, slight movements of the fingers, or irregular breathing. This state of affairs is interpreted as meaning that the patient is tiring of the mental effort of developing and maintaining the Y-state. He needs help. Help is given by communicating by non-verbal means that the therapist is at hand. This helps him maintain the active abstraction necessary for Y-state. Alternatively, the Y-state can be terminated by giving suggestions of sleep. If help does not come when it is needed, the patient gradually develops an increasing resentment. The Y-state breaks down, and the patient returns to full consciousness, tense and anxious.

In the induction of Y-state, care must be taken to see that the patient does not merely go into hypnotic sleep. The maintenance of Y-state requires constant mental effort on the part of the patient. So, even when the patient attains Y-state, there is still the tendency for him to relax his conscious exercise of will-power, and allow himself to drift into the passivity of hypnotic sleep. In order to avoid this, it may be necessary to give repeated suggestions emphasizing that the patient is not going to sleep. "You do it yourself." "You are wide awake." "Absolutely alert." "You hear the noises." "You hear the sounds from the

street, but you are not disturbed; you are absolutely calm; nothing can disturb you."

For the first few sessions, the patient is usually able to maintain the Y-state for only a relatively short period of time. At the first signs of tension, a transition is made from Y-state to hypnotic sleep. This is easy enough. The patient is given verbal suggestions. "Now there is a change. Everything lets go. Heavy, drowsy sleepiness comes all through you. Legs are heavy with it. You let yourself go with it. Deep, deep relaxing sleep comes all through you." The patient can be allowed to rest in hypnotic sleep and then awaken. In subsequent sessions, there is less evidence of tension, and the patient is allowed to remain in Y-state for longer and longer periods.

Y-state has also been induced in some patients with chronic anxiety who, on account of their insecurity or aggression, have been unsuitable for the prior passive induction of hypnosis. In these cases, a transition has been made from conscious relaxation to the Y-state.

Success is greater with patients who have an introvert bias to their personality, as their greater subjectivity makes the achievement of Y-state so much the easier. It seems that persons who have had some real experience of meditation or prayer, or even reverie, find it easier to make the transition to the Y-state.

The method has been used with success in some cases of chronic anxiety of many years duration in which an analytical approach did not appear rewarding.

Summary

Two different forms or manifestations of hypnosis are commonly used in clinical practice. These are hypnotic sleep, and hypnotic activity. Hypnotic sleep is used for giving therapeutic suggestions, and for resting the patient. In this form, the patient is utterly passive. Hypnotic activity is used in abreaction, and in all the various techniques of hypnoanalysis. In this form the activity, whether it is verbal, emotional or motor, is uncontrolled. An hypnotic variant can be induced which materially differs from both hypnotic sleep and hypnotic activity. It is a Yoga-like trance, and for convenience is referred to as the Y-state. It is a state of calm abstraction. It is distinguished from hypnotic sleep by the intense cerebration, and from ordinary hypnotic activity by the fact that activity is subjective and is actively controlled. Y-state has been used with encouraging results in certain cases of chronic anxiety.

SIMULATION AND HYPNOTIC AGE REGRESSION

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Interest in the alleged phenomenon of hypnotic age regression is certain to be stimulated by the recent studies by Reiff and Scheerer (1959). The most important point of controversy has centred around the dispute as to whether regressed behaviour, when it occurs, is a genuine revivification of earlier forms of behaviour (either specific items and/or general modes of behaviour) or whether the subject (*S*), consciously or unconsciously, stimulates behaviour appropriate to the age level to which he has been regressed.

In efforts to resolve this aspect of the problem attempts have been made to devise tests which are not easily simulable. Reiff and Scheerer (1959) have shown a great deal of ingenuity in this respect. For example, they used a Word Association Test, using stimulus words for which the commonest adult responses (e.g. man-woman) were quite different from those for children (e.g. man-work). Although the number of *S*s was small, they found that regressed *S*s responded appropriately, whereas *S*s instructed to simulate the regressed age were unable to do so accurately.

One of the most significant studies in this area was that of True (1949). Using 50 *S*s, he regressed them to ages 10, 7 and 4, and asked them on what day their birthday and Christmas day fell in that year. The results he obtained are summarized in Table 1, and are very striking. The validity of True's results, however, has been challenged on a number of grounds. Best and Michaels (1954) regressed *S*s to a year in which the birthday fell at a weekend. Four out of five *S*s, when asked to describe their actions on that day, reported going to school. Sutcliffe (1960) criticized the study in that True gave no details of the ages of the *S*s, did not state how long the *S*s were given to answer the questions, and did not test them for knowledge of earlier birthdays in the waking state. These objections are partially met by the study of Rieff and Scheerer (1954). Of five hypnotized *S*s, 20% recalled correctly the day of their tenth birthday, and 60% the day of their seventh birthday; whereas of 10 controls (simulators) tested for waking memory of tenth and seventh birthday, only one obtained the correct answer, which he reported as a guess.

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TABLE 1

Percentage of Subjects Correctly Identifying Day of Birthday and Christmas Day Under Hypnotic Age Regression

Regressed age	Percentage correct	
	Birthday	Christmas day
10 yrs.	92	94
7 yrs.	84	86
4 yrs.	62	76

(Data from: True, 1949).

A more serious objection raised by Sutcliffe (1960) forms the starting-point for the experiment reported in this paper. He argues that "without actually 'reliving the day' though hypnotic regression, subjects could give the correct day by deduction from available information: 1 year = 52 weeks and one day, and 1 leap year = 52 weeks and 2 days; thus to specify the day of a given date one has only to count back from 0 to 7 days as the number of years specifies." (Sutcliffe, 1960, p. 95). On the face of it, this explanation seems unlikely. True's results, however, are so important if valid, that any possible artifact must be excluded. The experiment reported below is an attempt to test Sutcliffe's hypothesis.

Procedure

Five groups of *S*s were separately tested over a period of four days. All were first year psychology *S*s, naive with respect to the purpose of the experiment and aged between 17 and 20 years. It was explained to each group that it was essential they should not divulge the nature of the experiment to other students during that week (any such leakage of information would probably tend to produce results *favouring* Sutcliffe's hypothesis, however). The general plan of the experiment is shown in Table 2. A description of the procedure with Group 1 will indicate the steps in the experiment. Each *S* was presented with a quarto booklet containing one step to a page (the pages were opaque). The pages for group 1 were as follows:

Page 1. *S* wrote his name and date of birth.

Page 2. "On which day of the week did your *most recent* birthday fall? Underline the *correct* answer below.

MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY".

Pages 3, 4 and 5. As for page 2, with the substitution of the words

TABLE 2
Design of Experiment

Procedure	Group				
	1	2	3	4	5
	Order of testing				
1. Date of birth					
2. Day of birthday					
Most recent	1	4	1	4	1
Age 10	2	3	2	3	2
Age 7	3	2	3	2	3
Age 4	4	1	4	1	4
3. How estimated					
4. Day of birthday					
Most recent	5	8	8	5	—
Age 10	6	7	7	6	—
Age 7	7	6	6	7	—
Age 4	8	5	5	8	—
5. How estimated					

"*tenth* (10th)", "*seventh* (7th)", and "*fourth* (4th)" for "*most recent*". Two minutes were allowed for each answer.

Page 6. "How did you arrive at the answers you gave in the last four problems? (If you used more than one method, indicate this). Underline the *correct* answer(s) below:

1. Remembered the day.
2. Guessed the day.
3. Worked it out

(indicate briefly how below)".

The *S*s were then presented with a *separate* sheet of paper containing the following statement: "You can work out the day on which your birthday fell in any particular year by making use of the following method:

1 year = 52 weeks and one day.

1 leap year = 52 weeks and two days.

Thus, to specify the day of a given date, it is merely necessary to count back from 0 to 7 days as the number of years specifies". *S*s were given one minute to study this statement. The original procedure was then repeated (i.e. most recent, 10th, 7th, and 4th birthday estimates), two minutes being allowed for each problem. Throughout this period, the separate sheet was placed before *S* and was available for reference, although he was allowed to use any method he liked.

Thus, in summary, the experiment was designed to show firstly whether *S* would *spontaneously* use Sutcliffe's method for calculating the appropriate days of the week; secondly, whether *S* would be *capable* of using Sutcliffe's method correctly when it was given to him.

The remaining groups were simply variations of this general procedure to control for some additional possible factors which might influence the results. In the case of groups 2, 3, and 4, the order in which the problems were solved was varied within the two parts of the procedure (before and after presentation of Sutcliffe's method). Group 5, however, served as a special control group. *Ss* in this group were first given the day of the week on which their most recent birthday fell and were then presented with Sutcliffe's method which they studied for one minute. They were then given the three problems once only (i.e., 10th, 7th, and 4th birthdays in that order) with specific instructions not to guess or remember, but to use only Sutcliffe's method. They were instructed to solve each problem in turn and given unlimited time to complete the problems. All *Ss* in this group completed the three problems in less than 15 minutes.

In this way, a thorough test of Sutcliffe's claim that True's results might be an artifact was obtained.

Results

The results are shown in Table 3. The initial information concerning date of birth was checked from the record cards of the *Ss* held by the University. Days on which their respective birthdays fell were checked from a 200-year calendar. Table 3 shows the percentage of correct responses for each birthday for each group before and after presenta-

TABLE 3

Percentage of Subjects Correctly Identifying Day of Birthdays

Day of birthday	Gp. 1	Gp. 2	Gp. 3	Gp. 4	Gp. 5	Combined Groups 1–4
	$n = 12$	$n = 10$	$n = 10$	$n = 17$	$n = 14$	
1. *First testing*						
Most recent	50	70	60	71	100	63.27
Age 10	25	40	30	29	50	30.61
Age 7	17	30	40	29	21	28.57
Age 4	17	10	30	23	29	20.41
2. *Second testing*						
Most recent	75	80	70	59	—	66.94
Age 10	25	20	40	35	—	30.61
Age 7	25	20	40	41	—	32.65
Age 4	25	10	40	41	—	30.61

tion of Sutcliffe's method for groups 1 to 4, and for group 5 with the deliberate use of Sutcliffe's method. The final column shows the percentage responses for groups 1–4 combined.

If chance factors alone were operating, it would be expected that roughly 14% of answers would be correct, since each time a choice is made there is one chance in seven that it will be correct. It is clear from a perusal of Table 3 that although the percentage of correct answers consistently runs above chance expectation, neither before nor after the presentation of Sutcliffe's method do the results approach the accuracy of True's hypnotized *Ss* (Table 1). The deliberate introduction of Sutcliffe's method of calculation does not lead to any dramatic improvement in score.

The results obtained with group 5 are even more striking. It will be readily apparent that the successful use of Sutcliffe's method necessitates the correct identification, by guessing, remembering, or working it out, of a base-line from which to calculate the other dates. The *Ss* in group 5 were not only told the correct day on which their most recent birthday fell, but were given unlimited time to calculate the remaining days by the use of Sutcliffe's technique. Yet not more than 50% of the group was successful in calculating any one birthday, and in the case of age seven, only 21% of the group obtained correct answers. Again, the results fall far short of those obtained by True's hypnotized *Ss*.

Certain other results are of interest. Of the 49 *Ss* in groups 1–4, no less than 42 did use either Sutcliffe's method, or a variation of it, in the first part of the experiment, the remainder either guessing the day, or claiming to remember it. After being presented with the technique, 46 out of the 49 made use of it. In other words, most of the *Ss* in this experiment did try to use the counting technique spontaneously, but most of them (Table 3) were unable to use it correctly.

TABLE 4

Number of *Ss* Solving All Four Problems Correctly, Using Sutcliffe's Technique

Procedure	Groups				
	1	2	3	4	5*
	Number correct				
First testing	0	1	3	3	3
Second testing	1	1	4	4	*
	(n = 12)	(n = 10)	(n = 10)	(n = 17)	(n = 14)

* Group 5 solved only three problems (i.e. 10th, 7th, and 4th birthday).

TABLE 5

Number of Subjects Correctly Identifying Day of Most Recent Birthday, Who Also Identified Day of Previous Birthdays

Procedure	Groups				
	1	2	3	4	5
1. *First testing*	(n = 6)	(n = 7)	(n = 6)	(n = 12)	(n = 14)
Age 10	1	4	3	3	7
Age 7	1	3	3	5	3
Age 4	2	1	3	4	4
2. *Second testing*	(n = 8)	(n = 8)	(n = 7)	(n = 10)	—
Age 10	1	2	4	5	—
Age 7	2	2	4	7	—
Age 4	2	1	4	7	—

Table 4 shows that only a very small proportion of *Ss* in the groups were able to use Sutcliffe's method successfully enough to obtain correct answers to all four questions in the first or second parts. Of the 49 *Ss* in groups 1–4, only six obtained correct answers to all eight problems.

Since correct identification of a reference point was essential to correct solution of the remaining problems, an analysis was made of the performance of those *Ss* in groups 1–4 who did correctly report the day of their most recent birthday. The results are shown in Table 5, together with the results for group 5, numbers being reported instead of percentages. Since each *S* made three other estimates, a total of 192 judgments was involved. Table 5 indicates that only 74 of these were correct. Thus, even if *Ss* did correctly identify their most recent birthday they still were unable to use the counting method with any real degree of success; and these results are confirmed by those for group 5, where *Ss* were given the day of their most recent birthday.

Discussion

It is clear from the results reported above that Sutcliffe was correct in hypothesizing that *Ss* placed in the experimental situation described will attempt to make use of the counting method. It is equally clear that his suggestion that this artifact might account for True's (1949) results is not supported by the results of this experiment. *Ss* using the method in the waking state do better than chance expectations, but fall far short of the achievement of the *Ss* hypnotically regressed by True.

There still remains the problem of explaining the results obtained by True (1949), and of accounting for the discrepancy between his results and those of Best and Michaels (1954). With regard to the former, the present author has suggested in a review of the literature on hyp-

notic age regression (Yates, *in press*), that the degree to which earlier habits (in this case "information") may be reactivated is a function of the degree to which those habits have been subsequently interfered with. It is arguable that simple pieces of information, although "forgotten", may lie dormant in the "memory system", but be capable of reactivation under appropriate circumstances, *because the trace has not been interfered with by subsequent learning.* Complex structures, on the other hand, would be more difficult to re-evoke, because such factors as retroactive inhibition would interfere with the structure of the memory trace.

The discrepancy between the results of True (1949) and Best and Michaels (1954) could be due to the small sample ($n = 5$) used by the latter compared with the former ($n = 50$). A more probable explanation lies, however, in differences in the hypnotic procedure used by the authors. Both Yates (in press), and Reiff and Scheerer (1959) have drawn attention to the importance of this variable. Although neither True, nor Best and Michaels, give sufficient details of their procedures, it seems possible at least that True regressed his *Ss* much more slowly than Best and Michaels. In other words, it may be important gradually to regress *Ss* back to the age level required under hypnosis, if that period is to be genuinely reinstated.

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THE EFFECTS OF HYPNOTIC, POST-HYPNOTIC AND WAKING SUGGESTION ON PERFORMANCE USING TASKS VARIED IN COMPLEXITY*

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Previous studies dealing with the effects of hypnosis on performance have yielded contradictory results. Young (1925) (1926) found no difference between hypnotic and control *Ss* or between hypnotic *Ss*' performance in the waking and hypnotic states. Eysenck (1939), however, found that his one *S* performed at a higher level in the hypnotic state than in the normal waking state. It has been twenty years since the publication of Eysenck's paper and the issue has not been settled. Furthermore, Eysenck hypothesized that improved performance under hypnosis varies inversely with the difficulty of the task. This hypothesis has not been tested in that time either. The disagreement between these two investigators is typical of the findings which emerge in other investigations of this sort (Hull, 1933; Uhr, 1958; Young, 1941).

Studies in this area are subject to a number of criticisms. First of all the depth of hypnosis achieved varies within a study or is not stated by the investigator. Secondly, investigators have not consistently used non-hypnotized control groups. Thirdly, in most studies, hypnosis has been used alone without any suggestion for improved performance. Fourthly, no study has ever compared the effects of different types of suggestion. Fifthly, cue change has not been held constant for hypnotic and control groups. The usual procedure has been to have control *Ss* learn and recall in the waking state and have hypnotic *Ss* learn in the hypnotic state and recall in the waking state. Finally, *Ss* are usually seen for many sessions and over long periods of time which does not minimize communication between *Ss* or cooperation on their part which might invalidate the findings.

The present study was designed to correct the indicated criticisms of

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previous studies. It employs a standard method of hypnosis (Pascal and Salzberg, 1959) where the depth of the hypnotic trance was the same for each experimental *S*. Controls of two sorts were used. Subjects served as their own controls by performing both in the normal waking state and following suggestion. Furthermore, a non-hypnotized waking suggestion group and a normal waking group served as control *Ss*. Three types of suggestion were compared and all *Ss* were tested with tasks of three levels of complexity; simple counting, immediate rote memory and a test of concept formation. Subjects were tested on the tasks in one session which minimized cooperation on their parts. Finally, the experiment was replicated.

Method

Subjects

Thirty-five male and female students from a general psychology course at the University of Tennessee volunteered as *Ss*. They ranged in age from 17 to 29 years with a median age of 19. It should be noted that *all* the members of the class volunteered for the experiment.

Tests

Two equivalent forms of three tasks were constructed. The simple task consisted of lines of numbers and letters, and *Ss* were instructed to count the numbers only. The task of medium complexity was a memory task consisting of a list of thirty six-letter nouns which *Ss* were instructed to memorize in order. The most complex task was concept formation which consisted of various completion items requiring ability to reason and to abstract.

Procedure

Subjects were placed in four groups; a hypnotic group (N equalled 10), a post-hypnotic group (N equalled 10), a waking suggestion group (N equalled 11), and a normal waking group (N equalled 4). The normal waking group was only included in the first experiment because their performance was not significantly different from the waking suggestion group. Besides, the waking suggestion group was really the crucial control group.

All *Ss* except those in the normal waking group were seen for two sessions. During the first session the hypnotic and post-hypnotic groups were given tests for hypnotic depth consisting of the Kohnstamm phenomenon, body sway, hand levitation, glove anesthesia, drawing in the trance state, posthypnotic amnesia and post-hypnotic suggestion. The procedure is described in detail by Pascal and Salzberg (1959). Subjects were assigned to groups randomly. Twenty-nine out of 56 *Ss* (52

per cent) were able to satisfy all the conditions of hypnotic depth during the first session. Twenty of these *Ss* were able to return for the second session to participate in the experiment proper.

The waking suggestion group performed the Kohnstamm phenomenon and the body sway only during the first session. The experimenter spent the rest of the time chatting with *Ss* about hobbies, interests, major subject and so forth. This kept the time spent with each group constant.

The normal waking group was seen only for the second session since it was not a crucial control group and was only included to check on practice, order and fatigue effects. All *Ss* were seen individually.

During the second session all three tasks were administered four times to all *Ss*. The order of the tasks on each administration was counting first, memory second, and abstraction third. Form I was administered the first two times and form II the second two times. The normal waking state and suggestion state were counterbalanced with half the *Ss* in each group following an ABBA order (normal waking-suggestion-suggestion-normal waking) and the other half a BAAB order (suggestion-normal waking-normal waking-suggestion).

Subjects in the hypnotic group were given a suggestion for improved performance while under hypnosis and then performed the three tasks in that state. Subjects in this group had amnesia for the suggestion and for their performance under hypnosis.

Subjects in the post-hypnotic group were given a suggestion for improved performance while under hypnosis. They were then awakened and asked to do the three tasks. They did not remember the suggestion given them while under hypnosis.

Subjects in the waking suggestion group were given the same suggestion while awake and then asked to do the tasks.

All three groups performed the tasks twice in the normal waking state without any suggestion for improved performance.

The normal waking group performed the tasks all four times while awake without suggestion.

The first experiment was run with four *Ss* in each of the four groups except for the waking suggestion group. Five *Ss* were in this group. The replication experiment used six *Ss* in each of the three groups. The normal waking group was not included for reasons mentioned previously.

Scoring

In order to enable each *S* to have a standard score across tasks percentage scores were calculated. Six scores were obtained for each *S*; an attempted and correct score on each of the three tasks. They were obtained simply by dividing the sum of *Ss* scores in both suggested conditions by the sum of his scores in the normal waking state and then

multiplying by 100. These six percentage scores indicated how much improvement in performance each *S* had made in the suggested state. For example, a score of 135 indicated that under suggestion an *S*'s performance had improved 35 per cent. Percentage scores would be meaningless and were not calculated for the normal waking group since there was no difference in treatment during the four administrations of the tasks, and therefore no suggested state.

Results

Table I presents the means for each experiment separately and for the combined experiments. Every mean in both the hypnotic and post-

TABLE I

Mean Percentage Change Scores from Waking to Suggested State

	N	Attempted scores		
		Counting	Memory	Abstraction
First experiment				
Hypnotic	4	111.8	125.8	112.0
Post-hypnotic	4	111.0	113.0	130.0
Waking suggestion	5	96.4	98.6	93.4
Second experiment				
Hypnotic	6	115.5	114.2	118.3
Post-hypnotic	6	114.7	112.2	120.3
Waking suggestion	6	98.5	99.2	97.0
First and second experiments				
Hypnotic	10	114.0	118.8	115.8
Post-hypnotic	10	113.2	112.5	124.2
Waking suggestion	11	97.5	98.9	95.4
	N	Correct scores		
		Counting	Memory	Abstraction
First experiment				
Hypnotic	4	63.8	119.5	108.3
Post-hypnotic	4	145.3	108.0	109.3
Waking suggestion	5	114.0	108.6	91.6
Second experiment				
Hypnotic	6	117.3	111.7	121.8
Post-hypnotic	6	109.8	120.7	112.5
Waking suggestion	6	101.2	92.3	100.3
First and second experiments				
Hypnotic	10	95.9	114.8	116.4
Post-hypnotic	10	124.0	115.6	111.2
Waking suggestion	11	107.0	99.7	96.4

TABLE II

Two-Tailed Probability Values Showing Differences between Groups

	Attempted			Correct		
	Counting	Memory	Abstraction	Counting	Memory	Abstraction
Hypnotic versus waking suggestion	.04	.01	.01	n.s.	.06	.01
Post-hypnotic versus waking suggestion	.01	.09	.01	n.s.	.07	.01
Hypnotic versus post-hypnotic	n.s.	n.s.	n.s.	.09	n.s.	n.s.

hypnotic groups is above one hundred except one. This is the correct measure for the hypnotic group on the counting task. In the first experiment all four *Ss* in this group performed at a lower level than their baseline in the normal waking state, and two out of six performed at a lower level in the second experiment after the measure was changed. As can be noted from the table, this measure yielded the greatest variability in the first experiment but in the second experiment it is in line with the results of the other measures. The waking suggestion group has five out of six means below one hundred. Wilcoxon-Mann-Whitney *Ts* were performed to test for differences between the three groups. Both experiments were combined and each task was treated separately. The probability values (two-tailed) are given in Table II. All probability values greater than .10 are reported as not significant. The hypnotic and post-hypnotic groups showed significantly better performance following suggestion than the waking suggestion group. This was true for every task on both measures except the correct measure of the counting task. Differences here were not significant. This was, surprisingly, the only point where the hypnotic and post-hypnotic groups differed significantly. The post-hypnotic group performed significantly better on the counting task due to the drastic reversals in the first experiment.

Figure 1 illustrates graphically the differences in performance between the hypnotic and post-hypnotic groups and the waking suggestion group. It should be noted that the least difference was found on the counting task and the greatest difference on the abstraction task. This is in direct opposition to Eysenck's hypothesis that improvement varies inversely with task difficulty.

A test for *consistency* of improvement within groups was also obtained. In the hypnotic and post-hypnotic groups, ninety scores were above 100, twenty below 100 and twenty exactly 100. The probability

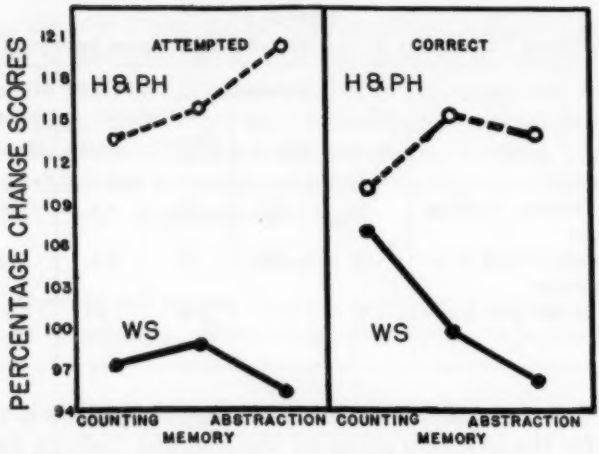

FIG. 1. Differences in improvement between the hypnotic and post-hypnotic groups (H & PH) and the waking suggestion group (WS).

that this occurred by chance was found to be less than .0001 (chi square equalled 39.6). Improvement, therefore, was highly consistent across tasks and *Ss* in the hypnotic and post-hypnotic groups. This same hypothesis applied to the waking suggestion group yielded a chi square of 5.5 and a probability of .02, but in the opposite direction. In other words, significantly more scores were *below* one hundred in the waking suggestion group than would be expected by chance.

Friedman's rank analysis of variance was applied to each group and to the attempted and correct measure separately. There were no significant differences between the three tasks except on the attempted measure for the post-hypnotic group (*P* equalled .06). Post-hypnotic *Ss* improved more on the abstraction task than the other two tasks. A chi square of 6.0 was obtained when the attempted scores were compared with the correct scores of the hypnotic and post-hypnotic groups. This indicates that following suggestion, these groups improved significantly more in attempted scores than in correct scores (*P* equalled .02). This was not true of the waking suggestion group. In this group, no significant differences were found between attempted and correct scores.

Discussion

The major finding of this study was that following hypnotic and post-hypnotic sugestion *Ss* improved significantly more than following waking suggestion. Waking suggestion *Ss* did not improve but performed at a lower level. This was true for tasks of varying complexity.

It does not conform to Eysenck's hypothesis that improvement decreases as tasks become more complex. In fact, the most consistent improvement was found on the abstraction task which was the most complex task. The least consistent improvement was found on the simplest task, counting.

There are several explanations for the positive findings of the present investigation. First of all, *Ss* were all able to achieve deep hypnosis. Previous studies used varying levels of hypnotic depth. Second, hypnotic suggestion and post-hypnotic suggestion were used rather than hypnosis alone. Few studies have used suggestion in conjunction with hypnosis. There is no reason to believe that hypnosis has any effect on performance unless suggestion for increased efficiency is given. Cue change was minimized by having all groups perform in the same state as they were tested. The inclusion of a waking suggestion group as a control group was necessary to insure that the results obtained were related to the hypnotic effect rather than to suggestion alone. A waking suggestion group has rarely been included in past investigations.

Previous studies have demonstrated that it is not hypnosis alone that is responsible for improved performance. This study has demonstrated that waking suggestion does not lead to higher performance. It seems like the combination of hypnosis and suggestion is necessary. This combination yields improved performance on complex as well as simple tasks. The abstraction task is similar to tasks found on intelligence tests. Increased motivation or practice do not usually alter an individual's performance on these tasks. It is, therefore, possible that the combination of hypnosis and suggestion leads to a narrowing of the perceptual field and increased cortical efficiency. This hypothesis would, of course, have to undergo further testing before any definite conclusion could be drawn.

Summary

An experiment was performed using volunteer university students to test whether hypnotic, post-hypnotic and waking suggestion had any differential effects on the performance of a counting, a memory, and an abstraction task. It was found that both hypnotic and post-hypnotic suggestion led to better performance whereas waking suggestion led to poorer performance. Improvement following hypnotic suggestion was not significantly different from improvement following post-hypnotic suggestion. Improvement did not vary *significantly* on the three tasks. However, hypnotic and post-hypnotic *Ss* tended to improve more as tasks became more complex. The implications of the findings were discussed.

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A NOTE ON A CHANGE IN MENTAL AGE ACCOMPANYING HYPNOSIS OF A 'TEEN-AGE GIRL

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During recent years a considerable number of workers in the psychological sciences have commented on the instability of intellectual functioning and efficiency in certain instances. For reviews of related literature see works such as Thompson and Engler.

No doubt some of this instability stems from the interaction of brain damage and factors of a more functional nature. As Bender puts it in a slightly different context "Children that have come to the Psychiatric Division of Bellevue Hospital with a behavior problem associated with an organic brain disorder have always other emotional and social problems in their life situation severe enough to account for the behavior disorder on a reactive basis alone." And she continues "These and various immediate stresses are [in certain instances, no doubt] more important than the possible pathology in the brain."

Although Bender's reference is not directed specifically toward behavior related to intellectual efficiency, it appears justified to say that performance on an "intelligence test" is a form of behavior.

No doubt, in addition to the factors indicated above there are also other factors related to "intellectual efficiency," including sensory difficulty, a recently experienced situation resulting in emotional upset, and various factors stemming from the environment.

This brief paper deals with a discussion of a 'teen-age girl whose level of intellectual efficiency changed sharply, perhaps because of a possibly related hypnotic experience.

Case Report

Vicki was a 15-year-old girl referred for psychological evaluation and opinion as to whether or not hypnotherapy might be of help to her. She had been considered "retarded" since early childhood.

She came from an upper income family. Her mother was a professional person who seemed to have reasonably good insight into Vicki's problems. There was no evidence of prenatal difficulty and no evidence of cause of brain damage known up to the time of this examiner's evaluation.

Previous efforts by other workers to diagnose Vicki were conflicting.

Some workers believed Vicki's troubles stemmed primarily from organic brain damage and others felt her difficulties were primarily functionally based. The actual causes of her "retardation" difficulties and their relative importance are not the primary subject of this paper however, although this examiner felt she was both brain damaged and functionally upset.

This examiner saw Vicki five times in all. As is the case with many disturbed individuals, Vicki's attention span was extremely limited. She also displayed strong negativistic trends. She seemed to use these latter as a means of controlling her environment.

On the second meeting, effort was made to gain some insight into Vicki's possible general level of intellectual functioning. Since her attention span was so short, it was decided to use testing materials which could be given in a brief time. Thus, the Kent E-G-Y test was given. Vicki achieved a mental age of about four years.

On the third meeting, effort was made to hypnotize Vicki. It was not an easy thing to do because of her short attention span and generally negativistic tendencies. However, it was believed she entered a light trance in about fifteen minutes. The E-G-Y test was again administered while the subject was hypnotized and this time Vicki achieved a mental age of ten years.

This indicated Vicki's measured "mental age" more than doubled—went up by six years—in the course of twenty-four hours.

It should be mentioned here that the E-G-Y scale is based primarily on informational factors, and it probably provides at best only a rough estimate of what some workers are pleased to call "verbal intelligence." However, the amount of increase shown could be important under the circumstances.

Also, it is evident that the possibility for coaching Vicki might have existed in the 24-hour-interim between tests. However coaching was unlikely as an issue, because her mother was the only possible person who likely might have done any coaching, and the mother enjoyed only the most limited proximity for hearing what was going on in the testing situation. She was either in a separate room or outside the building during the time of testing. Secondly, the mother seemed not to be the sort of person who would coach Vicki for the second administration even if she had been able to hear enough fragments of the first test administration to be able to do this. (The mother was asked to remain in limited earshot during all contacts with Vicki for the professional protection of the writer.) Thirdly, the mother did not know that a second administration of the test had been contemplated for the day following the first administration. Fourthly, Vicki was probably not the sort of person

subject to quick coaching anyway, or she probably would never have been referred for help.

Conclusion

From the above, it seems reasonable to conclude that it is likely Vicki's improvement on testing stemmed possibly from the relaxedness she was able to achieve from the light hypnotic trance. In the opinion of this examiner, the ten-year-level (mental age) was closer to her "true" level of functioning than was the first level achieved. It is quite possible she already knew the material needed for the higher level of test achievement, but this material may not have been readily accessible to her until hypnosis was induced.

It should be stressed this examiner feels the material in this paper should be interpreted guardedly, because it is based only on a single case history. On the other hand, it appears that what may happen in one instance may likely happen in others. Therefore, with some subjects it might be well to do additional "intelligence" testing in both the non-hypnotized and hypnotized states. It may be that in some instances hypnosis could be used to aid the intelligence test performance of some persons who are hindered considerably by factors which are primarily functional. After all, in the case of Vicki, the mental age did show a rather substantial gain in a twenty-four-hour period.

As for Vicki, herself, efforts to hypnotize her again on the three following days were fruitless. Seemingly, her short attention span and negativistic tendencies precluded ready trance induction.

It was felt, however, that because of the rather marked rise in mental age that was demonstrated, some of her problems may have been sufficiently functionally based so that she might be helped to some extent by certain psychotherapeutic techniques.

Inasmuch as Vicki and her mother were away from their home state and adequate psychological help was available for a person with Vicki's problems in that state, it was recommended she and her mother return home—so that aid could be given without the unnecessary expense of living away from home.

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THE VALUE AND LIMITATION OF HYPNOSIS IN PSYCHOTHERAPY: TWO CLINICAL ILLUSTRATIONS

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Any meaningful discussion of the value and limitation of hypnotherapeutic approaches in the treatment of emotional or mental illness in and of itself constitutes a discussion of the value and limitation of contemporary psychotherapeutic techniques. Although we make reference to the term "hypnotherapy" it would seem questionable whether the term itself is a valid one in that it implies an approach somewhat tangential to other forms of psychotherapy. In this respect, one cannot conceive of techniques of treatment involving hypnosis in psychotherapy as being different from psychotherapeutic approaches in their overall frame of reference and treatment incorporation, as one might think of pharmacological therapy, shock therapy, or other forms of non-psychotherapeutic treatment of behavior disorders. Schneck's observations on hypnosis and hypnotherapy are worth repeating in this connection: "Hypnotic methods are obviously adjuncts to a total psychotherapy. As hypnotherapy develops further, it will continue to be integrated with the overall growth of knowledge about psychodynamics." (Schneck, 1957).

The contemporary scene with respect to the utilization of hypnosis in psychotherapy is one which moves in somewhat opposing directions. There is the continuing recognition of the meaningfulness of hypnotic technique as a selective modality for evaluating and managing aspects of psychotherapeutic process within a variety of therapeutic settings ranging from classical psychoanalytic approaches and including such methods as non-directive psychotherapy and the eclectic psychotherapies. Within these overall approaches we see an increasing emphasis upon the development of psychodynamic means for dealing with ideational content as well as emotional response in which hypnosis may at times become either directly or indirectly a useful procedure. In this respect, I do not mean to limit its usefulness to a recovery of either screened or forgotten material or to the forced development of fantasy and other projective responses which may be valuable in exploring and bringing into awareness aspects of patients' subjective responses to themselves and their environment, but also as a means of permitting a

more open and complete encounter with those aspects of personality that may remain obscure, rigid or inaccessible with respect to psychotherapeutic techniques on a non-hypnotic level.

In its supportive role, hypnosis is a productive process for permitting ventilation, catharsis, and the general release of ideas and feelings which in themselves intensify fundamental conflicts and become incorporated in some of the more externalized symptomatology of the patient. In this respect, for patients with reasonably good ego strength, with the capacity for effecting workable transference relationships and for permitting the relinquishing of certain degrees of ego control, hypnosis affords the possibility of penetrating those more externalized defenses which, very often, constitute immobilizing self-defeating and self-punitive characteristics of the patients' everyday pattern of living. These are also the symptoms which patients often tend to focus upon and to conceive of as their major problems, with real resistance to dealing with the underlying psychopathology and character problems which become, in instances of intensive psychotherapy, the primary focal point.

Where phobic, obsessional and, at times, somatic problems become the immediate fixation of the patient, the utilization of hypnosis as a means of modifying rather than "curing" these particular symptoms is most valuable in permitting the redirection of therapy toward fundamental goals in relation to the overall personality of the patient and permits the divergence of attention from the symptomatic level to the level at which character defenses and character reactions are more likely to be experienced rather than expressed.

In another, less appealing direction is the resurgence of hypnosis in the form of "suggestive therapeutics" based upon a non-rational concept of suggestion reminiscent of "medical moralization" and the direct allaying of symptoms.

To attempt to survey or review the literature at the present time in connection with values and limitations of hypnosis in the whole area of psychotherapy is beyond the scope of this paper. In a forthcoming publication this issue is reviewed and discussed in relationship to contemporary developments in psychodynamic theory and therapeutic concept. (Kline, 1960).

In most instances, patients with whom hypnosis might be considered useful, would be patients for whom there is a reasonably good prognosis in terms of psychotherapy generally. This is not to imply that there may not be a recognition of considerable resistance and difficulty but that the overall motivation and ego structure of the patient is such as to permit him to utilize psychotherapy. For the greater part, these are patients

with focal problems of anxiety, phobias and a variety of difficulties in coping with and managing everyday aspects of their living as it may relate to occupational adjustment, marriage and interpersonal relations.

Hypnosis may at the opportune time in the early stages of therapy, permit the development of a positive transference more rapidly and perhaps more completely than would usually take place within that period of time. As such, it frequently serves to involve the patient more actively in the therapeutic process, to bring about spontaneous increases in verbalizations and meaningful projective behavior as evidenced through dreams, associations, and subjective responses to the therapeutic interaction itself.

An example of how hypnosis may be used at this point as a valuable technique in the redirection of therapeutic interest is illustrated by a twenty-four year old married woman referred by her internist with whom she had discussed her compulsive habit of hair pulling. This woman had been pulling out her hair since the age of nineteen and would frequently denude large patches of her scalp in a matter of two or three weeks through systematic compulsive pulling. There would also, at times be local irritation of the scalp itself and this occasioned more than frequent visits to her physician.

The patient had, some two years prior to being seen, been referred for psychotherapy but after seven sessions with a psychoanalyst came to the feeling that there was no need for psychotherapy since she saw no problems apart from the pulling of the hair. The psychiatric evaluation and report, which had been sent on to the same physician who referred the patient this time, indicated the presence of considerable emotional disturbance involving a great deal of anger and rage towards the patient's husband with resulting periods of depression which he felt were essentially on a hysterical basis. The patient was extremely reluctant to discuss any aspect of her marital or personal relationships and, as such, broke off treatment after the seven sessions mentioned.

During the first two sessions, the reasons for her referral this time were explored and some attempt was made to evaluate why she had terminated her previous treatment. The patient continued to express resistance towards dealing with anything except her symptom. On the third visit, hypnosis was attempted for the first time and a medium trance state evolved rather easily. The approach was essentially one which permitted the patient to relax, to feel somewhat at ease, and then she was instructed to visualize a scene in which she would see someone like herself, but not herself, who would be pulling her hair.

Fixation upon the imagery was maintained until from the quality of

the verbalization and general appearance of the patient indicated some evidence of dissociation. The patient was further instructed that the scene would start to change and develop into something more like a play and that the play in itself would explain some of the reasons why this particular girl was pulling her hair. The patient then went on to describe the image in the scene becoming very, very angry and shouting, "I hate you! I hate you and I will get even with you," at which point she described the girl in the scene as picking up a pencil and gouging her eyes out.

Now the patient began to cry hysterically and was permitted to come out of the hypnosis by encouragement. She went on voluntarily to discuss many of her own feelings of resentment and anger, originally toward a very domineering, controlling mother figure for whom she had death wishes which, in themselves were conflicting and difficult to deal with. She indicated that the relationship with her husband was in many respects similar to that with her mother and that the husband tended to be somewhat overcontrolling, highly critical and treated her as a child.

At the end of the session, the patient looked up and said, "I guess I am pretty mixed up, but I had never really thought so." From that point on the patient accepted psychotherapy directed toward her more fundamental personality problems and for the next several months hypnosis was not utilized at all, since the patient made good progress in psychotherapy generally. No attempt was made at any time to influence or alter the presenting symptom, which over the several weeks following the initial hypnotic session evidenced a gradual dimunition, and within a month the hair pulling had ceased completely.

The patient continued in treatment for almost two years during which hypnosis was used at varying points in therapy essentially to deal with aspects of transference problems and emerging hostility which at times became directed towards the therapist. The value of hypnosis in this particular case was in terms of the clarification of the problem on the part of the patient, and the acceptance of the reality of feelings which led to an increased and spontaneous motivation for treatment. This is not an instance of what might be described as "hypnotherapy", but rather psychotherapy in which hypnosis was a valuable technique at specific and selected times during the course of therapy.

In contrast, in the case of a 38 year old woman who was treated with hypnotherapy in the "other direction" which some aspects of "hypnotherapy" is taking on today. This 38 year old wife of a physician had for a number of years been an excellent skier but, at various times became overwhelmed by fears of skiing and could not at that time ski. She was, by her own recognition as well as others', an accomplished skier and both

she and her husband look forward to weekends at ski resorts. Unfortunately, after making arrangements and arriving some several hundred miles from New York City she would without any previous warning suddenly find herself extremely phobic and not able to even put on the skis. At other times she sad no difficulty whatsoever.

The patient's husband's colleague had recently taken a short course in hypnosis and, discussing this with him, they wondered if hypnotherapy might be useful in dealing with this phobic reaction which seemed to be without any obvious underlying cause. The patient, being accepting of this approach, was seen on two occasions during which, from the report, she developed a deep somnambulistic state. During the hypnosis, she was told to "bear in mind that she was an accomplished skier, that she was capable of handling and dealing with all of the aspects of skiing and that from this time on, whenever she felt frightened about skiing, she would become much more aware of her previous successes in skiing and that her *confidence* would immediately come into *consciousness* and she would *not be afraid.*"

For several weeks following the brief hypnotherapeutic treatment, the patient had no difficulty in skiing, but this was not unusual and had occurred many times before. Finally, some four weeks after hypnotherapy, while at a ski resort she said to her husband, "You know for the first time I am aware that I do feel frightened this morning but it's different than it's ever been before. I feel frightened inside but it doesn't really seem to bother me." The patient then proceeded to ascend the slope and go skiing.

That morning, while skiing she fractured her right leg, suffered multiple internal injuries and severe lacerations.

Following the accident and because of the circumstances relating to the use of hypnosis, the writer had an opportunity to see this patient. She was anxious to explore some of her own feelings about her fear of skiing with particular respect to the accident, and in the course of doing this, it became apparent that this had not been a monosymptomatic reaction. *There were times when she was afraid to drive her car, when she was afraid to go shopping alone,* and *when she was afraid to use sharp knives.* She thought of these fears as being "silly" since they occurred only once in a while and never repeatedly.

During the course of several hypnosis sessions, it became clearer that there was no real fear of skiing or of driving a car or of the use of sharp knives. The real fear was that at times, when this woman would experience tremendous hatred and rage towards her husband, she would have a wish to punish him and her way of punishing him was to think of suicidal and self-destructive ideas. She would become quite frightened at

this and the fears which she developed constituted a mobilization of defenses against these self-destructive impulses.

Her basic hatred toward the husband went back to a forced abortion which had occurred a number of years before and for which there had been inadequate compensatory adjustment. In this instance we see how the use of a *successful hypnotherapeutic approach* by focusing upon the symptomatic expression and not allowing or permitting a fuller involvement of the patient with her real problems turns out in the long run to *be quite unsuccessful. The limitations are not of hypnosis,* since this was a woman who obviously could make use of it, but a *limitation in an approach of psychotherapy* which became symptom oriented and symptom limited in an instance where such an approach was contra-indicated. This is not to imply that there are not cases where a symptomatic approach is indicated. (Kline, 1958) There are a number of instances involving phobic as well as other types of conversion-like reactions where the symptomatology assumes a somewhat autonomous and residual characteristic and may be approached quite directly, and symptom alteration, modification, substitution or even removal, can be carried out effectively. This is a matter of determination of goals in psychotherapy and of the diagnostic reasons for undertaking certain psychotherapeutic approaches.

These two brief clinical illustrations, point out only that the values and the limitations of hypnosis in psychotherapy have much more to do with the values and limitations of particular psychotherapeutic approaches and that the selective value of hypnosis in itself is almost completely dependent upon these factors rather than upon anything unique or intrinsic in hypnosis alone.

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WORLD CONGRESS OF PSYCHIATRY

The Third World Congress of Psychiatry, June 4–10, 1961, Montreal, Canada, is being held at the invitation of McGill University and under the auspices of the Canadian Psychiatric Association. Meeting on the American Continent for the first time, the Congress is expected to attract some 3000 delegates from 62 nations. Representatives will come from psychiatry and such allied fields as general medical practice, psychology, biochemistry, nursing, sociology, anthropology, social work, and pharmacology.

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Index to

THE INTERNATIONAL JOURNAL OF CLINICAL AND EXPERIMENTAL HYPNOSIS

Volume VIII 1960

January—Number 1

The Psychodynamics of Recovery Under Hypnosis
JACOB H. CONN 3

Hypnotic Age Regression and Psychotherapy: Clinical and Theoretical Observations
MILTON V. KLINE 17

Special Aspects of Hypnotic Regression and Revivification
JEROME M. SCHNECK 37

An Electrophysiological Theory of Hypnosis
DONALD R. ROBERTS 43

Recall Under Hypnosis of Amnestic Events
ROY M. DORCUS 57

The Shared Neurosis: Hypnotist and Subject
HAROLD LINDNER 61

Book Review: G. Ambrose and G. Newbold, *A Handbook of Medical Hypnosis*
GORDON A. BISSESSAR 71

April—Number 2

"Credulous" and "Sceptical" View of Hypnotic Phenomena
J. P. SUTCLIFFE 73

Hypnosis in the Management of a Case of Placenta Abruptio
WALTER HARTMANN AND CAROLYN M. RAWLINE 103

The Systematic Use of Hypnosis in Individual and Group Psychotherapy
JACK FOX 109

Statistical Report on General Practice Hypnodontics; Tape Recorder Conditioning
JAMES D. JACOBY 115

Hypnosis in Asthma
A. PHILIP MAGONET 121

Book Reviews 129

July—Number 3

Blood Pressure and Pulse Rates in Neutral Hypnosis
HAROLD B. CRASILNECK AND JAMES A. HALL 137

Levels of Insight and Ego Functioning in Relation to Hypnoanalysis
SAMUEL BARON 141

Incest Experience During Hypnoanalysis
JEROME M. SCHNECK 147

The Frequency of Naturally Occurring 'Hypnotic-like' Experiences in the Normal College Population
RONALD E. SHOR 151

Reflections Upon Certain Specific and Current Uses of the "Unconscious" in Clinical Hypnosis
ANDRE M. WEITZENHOFFER 165

October—Number 4

Editorial
MILTON V. KLINE 179

The Use of Hypnosis in Internal Medicine
BERNARD B. RAGINSKY 181

An Electroencephalographic Study of the Waking State and Hypnosis with Particular Reference to Subclinical Manifestations of Sleep Activity
J. DIAMANT, M. DUFEK, J. HOSKOVEC, M. KRISTOF, V. PEKAREK, B. ROTH, AND M. VELEK 199

The Abstract Image in the Post Hypnotic State
GOSAKU NARUSE 213

Comment on a Theory of Hypnosis
JEROME M. SCHNECK 231

The Y-State: An Hypnotic Variant
AINSLIE MEARES 237

Simulation and Hypnotic Age Regression
AUBREY J. YATES 243

The Effects of Hypnotic, Post-Hypnotic and Waking Suggestion on Performance Using Tasks Varied in Complexity
HERMAN CARL SALZBERG 251

A Note on a Change in Mental Age Accompanying Hypnosis of a 'Teen-age Girl
HALLACK MCCORD 259

The Value and Limitation of Hypnosis in Psychotherapy: Two Clinical Illustrations
MILTON V. KLINE 263

World Congress of Psychiatry 269

Call for Exchange of Publications and Papers 269

Index 271

October, 1960 BF

VOLUME VIII • NUMBER 4

THE UNIVERSITY OF MICHIGAN

137
141
147
151
165
179
181
199
213
231
237
243
251
259
263
269
269
271

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4.7 *References and Quotations in the Text*

4.71 *References.* Show all references in the text by citing in parentheses the author's surname and the year of publication as entered in the list of references at the end of the article. Example: ". . . a recent study (Jones, 1958) has shown. . . ."

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Jones, C. L. The perception of space. *J. exp. Psychol.*, 1958, **56**, 3–17. (a)

Jones, C. L. Space factors. *J. appl. Psychol.*, 1958, **42**, 91–102. (b)

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